MINUTES OF THE MEETING OF THE NORTH CENTRAL CORN BREEDING RESEARCH COMMITTEE
1957

Reported by
Merle T. Jenkins, Secretary

Crops Research Division
Plant Industry Station
Beltsville, Maryland
430CC April 1957

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NORTH CENTRAL CORN BREEDING RESEARCH COMMITTEE

The 1957 meetings of the North Central Corn Breeding Research Committee were held in Chicago, Illinois, on March 5, 6, and 7. The sessions of March 5 and 6 were held in the Illini Center at the LaSalle Hotel. On March 7 Committee members toured the corn milling plant of American Maize-Products Company at Roby, Indiana.

MORNING SESSION, MARCH 5

The meeting was called to order by Chairman Rossman at 10:10 a. m. The following individuals were in attendance at one or more sessions of the committee meetings.

ROSTER OF ATTENDANCE

Illinois

Beckett, J. B. (USDA)
Jugenheimer, R. W.
Leng, Earl R.
Lund, Harvey A. (USDA)

Indiana

Brunson, A. M. (USDA)
Crane, Paul
House, L. R.
Kramer, H. H.
Nelson, O. E., Jr.
Richardson, D. L.
Ullstrup, A. J. (USDA)
Volk, N. J.

Iowa

Dicke, F. F. (USDA)
Penny, L. H. (USDA)
Russell, W. A.
Sprague, G. F. (USDA)

Kansas

Findley, Wm. R., Jr. (USDA)

Kentucky

Loeffel, F. A.

Michigan

Rossman, E. C.

Minnesota

Linden, D. B.

Missouri

Coe, Edw. H., Jr., (USDA)
Grogan, C. O. (USDA)
Nuffer, M. G.
Zuber, M. S. (USDA)

Nebraska

Lonnquist, H. H.
Sahni, V. M.

Ohio

Dollinger, E. J.
Stringfield, G. H. (USDA)

Oklahoma

Brooks, J. S.

North Dakota

Wiidakas, Wm.

South Dakota

Shank, D. B.

U.S. Dept. of Agriculture

Heerman, Ruben M. (SESD)
Jenkins, M. T. (CRD)

Wisconsin

Neal, N. P.
Strommen, A. M.
Tsotsis, B.

Following introductions, Chairman Rossman appointed a Nominating Committee consisting of R. W. Jugenheimer, Chairman, G. H. Stringfield and A. M. Brunson. The Chairman reminded the group of the January 1 deadline for reports on cooperative tests and the April 1 deadline for seed of entries in the uniform tests to be in the hands of distributors. The Chairman then called for reports of the committees on the uniform tests of AES hybrids.

TESTS OF AES HYBRIDS AND CANDIDATES

Uniform tests of AES hybrids and candidates involving all nine of the different maturity groups were conducted in 1956. The data from these tests were summarized by committee chairmen and the summarized results were discussed in connection with the assignment of new AES designations.

The Sub-Committee on Uniform Tests of 100, 200 and 300 maturities sponsored uniform tests of AES hybrids and candidates in all three of these maturities. Tests were conducted in North Dakota, Wisconsin, Michigan, and South Dakota. Data from the different tests were assembled by the Chairman, Wm. Wiidakas. The summarized results for the tests of 100-200 maturity series for 1955 and 1956 are reported in table 1 and those for the 200-300 maturity series are reported in table 2.

It was MOVED by Wm. Wiidakas that the Hybrid CB2304 be assigned the regional designation of AES202.

Seconded by D. B. Linden and passed.

It was MOVED by D. B. Linden that CB2310 be assigned the regional designation of AES203.

Seconded by Wm. Wiidakas and passed.

D. B. Linden announced that CB2316 will be released as Minhybrid 712, M135 as Minhybrid 611, and M136 as Minhybrid 612.

Wm. Wiidakas announced that ND301B will be released as ND307 and N35 will be released as ND403.

Table 1. Average performance of the AES hybrids and candidates of 100 (AES 101) and 200 (Wis.240) maturities compared in four states in 1956 with comparative data from 1955.

Cross No.	Yield (bu./A) N.D.	Yield Wis.	Yield Mich.	Yield S.D.	Score %W240 1956	Score %W240 1955	Moisture % N.D.	Moisture Wis.	Moisture Mich.	Moisture S.D.	Score %W240 1956	Score %W240 1955	Root Lodging % N.D.	Root Lodging % Mich.	Stalk Lodging % N.D.	Stalk Lodging % Mich.	Corn Borer Rating	Shelling % N.D.	Shelling % Wis.	Plant Rating N.D.	Plant Rating Wis.
W240	56.1	87.4	58.0	40.2	100	100	37.0	27.4	32.6	14.2	100	100	7.5	18.8	11.0	12.0	8.5	81.5	81.8	3-4	1-2
AES101	56.6	82.5	53.4	38.3	96	102	29.1	21.1	29.6	13.7	84	82	5.0	12.4	5.0	6.7	6.0	81.1	82.0	3	2
ND306	63.5	86.1	69.5	38.6	107	113	34.2	22.9	30.4	12.5	90	102	9.0	10.4	5.5	7.5	8.0	79.0	78.9	2-3	3
AES201	55.7	76.8	69.2	42.1	101	113	35.0	21.8	30.8	12.1	90	102	5.0	7.8	4.5	4.3	9.0	79.8	78.7	2-3	2
MS160	57.4	87.4	76.9	40.9	109	109	36.9	19.4	33.3	14.7	94	89	5.5	14.7	5.0	2.8	-	83.8	82.3	2-3	2
N107	60.7	86.1	73.7	42.8	109	-	36.9	23.1	31.5	12.1	93	-	7.0	19.0	5.0	4.1	-	79.2	77.6	2-3	2
CB2316	62.5	93.9	69.2	43.3	111	-	37.3	27.2	33.6	17.2	104	-	2.0	7.0	5.0	3.5	-	80.6	79.8	3	2
M103	61.1	85.6	75.2	45.0	110	130	37.4	23.1	30.7	12.8	94	101	4.5	1.7	6.5	2.1	-	80.0	79.0	2	2
CB2304	63.2	97.2	79.8	43.5	117	-	40.0	27.5	30.9	12.7	100	-	5.5	12.3	7.0	6.0	-	80.1	78.7	3-4	2
CB2310	60.9	91.3	75.3	44.9	113	-	40.6	27.5	33.2	11.1	101	-	4.5	6.3	5.0	2.3	7.0	78.7	76.2	2-3	2
N132	63.1	84.9	73.7	46.8	111	-	40.9	26.5	31.0	15.1	102	-	6.5	11.6	5.0	4.4	-	79.4	78.5	2-3	2
CB1329	58.8	91.0	71.8	49.9	112	133	41.3	25.8	34.3	14.1	104	116	5.0	8.1	5.5	6.6	8.5	81.0	80.7	2-4	2
ND301	59.4	74.9	65.8	-	99	113	35.4	20.1	33.5	-	92	102	5.0	9.4	5.0	4.2	7.5	80.2	79.4	2-3	2-3
ND301B	62.2	72.4	70.4	-	102	-	36.9	21.9	30.2	-	92	-	5.5	20.0	5.0	2.9	7.5	79.7	78.0	2	3
N35	60.5	93.2	75.7	-	114	-	42.5	26.4	34.3	-	106	-	9.5	27.3	5.0	3.1	8.5	80.7	80.0	2	3
N31	61.0	90.3	62.7	-	106	-	36.7	25.0	33.8	-	99	-	9.0	20.2	7.0	7.5	8.0	81.2	80.9	2-3	3
CB1235	59.4	-	-	-	106	-	29.8	-	-	-	81	-	9.0	-	7.0	-	-	81.0	-	2-4	-
CB1352	60.0	-	-	-	107	126	36.6	-	-	-	99	108	5.0	-	7.0	-	-	79.9	-	3	-
L.S.D.	3.2	-	4.2	6.0			2.0	-	1.4	-											

Pedigrees

W240	(W85 x W15)(WD x W9)	CB2304	(CD5 x W59M)(A509 x MS1334)	CB1235	(WD x Mt42)(W103 x ND203)
AES101	(WD x ND203)(CV3 x W103)	CB2310	(CD5 x A509)(W59M x MS1334)	CB1352	(W65 x A90)(A116 x ND203)
ND306	(WM13 x A90)(WD x ND203)	N132	(CR5 x A508)(W59M x A498)	ND301	(ND230 x ND203)(A111 x A90)
AES201	(W33 x A116)(A90 x ND203)	CB1329	(W33 x ND203)(W79A x A90)	ND301B	(ND230 x ND203)(A90 x MS1334)
MS160	(49 x C105)(H x MS206)	CB2316	(CD5 x W59M)(A509 x A498)	N35	(ND230 x ND203)(W79A x A208)
N107	(CD5 x A498)(A509 x A513)	M103	(A495 x A509)(A502 x A556)	N31	(ND52 x ND203)(W79A x W103)

Table 2. Average performance of the AES hybrids and candidates of 200 (Wis.240) and 300 (Wis.355) maturities compared in four States in 1956.

Cross No.	Yield bushels/Acre N.D. Av.3	Yield Wis.	Yield Mich.	Yield S.D.	Score % of W355	Moisture % N.D. Av.3	Moisture Wis.	Moisture Mich.	Moisture S.D.	Score % of W355	Lodging Root % N.D.	Lodging Root % Mich.	Lodging Stalk % N.D.	Lodging Stalk % Mich.	Corn Borer Rating	Shelling % N.D.	Shelling % Wis.	Husking Qual.	Rating Plants N.D.	Rating Plants Wis.
SD220	65.9	81.8	69.5	40.2	96	33.3	25.6	35.4	14.0	92	5.1	8.0	7.2	5.2	-	81.7	81.1	m	2-3	1
W313	69.9	104.7	81.7	48.1	114	33.6	23.2	31.8	14.0	87	6.0	8.4	4.5	2.9	-	79.9	78.3	m	1-2	1
MH803	67.4	93.4	86.3	44.1	110	29.9	25.6	32.3	10.2	86	8.0	16.5	6.5	4.3	-	78.0	76.6	e	3	2
M135	68.4	85.2	83.7	47.6	105	36.0	23.4	32.1	15.0	90	2.0	3.3	4.5	4.6	-	79.0	79.1	me	2-3	2
M136	65.2	92.2	78.1	45.9	104	33.7	24.3	32.9	15.0	89	4.0	1.0	5.5	2.4	-	80.4	79.7	m	2-3	2
SD250	67.1	86.5	80.1	42.1	104	39.7	24.9	34.5	15.7	97	2.0	1.1	4.5	3.8	-	80.9	77.9	m	1-2	3
N150	63.4	80.1	70.8	41.4	95	34.1	23.8	34.7	14.8	91	5.5	9.4	6.5	3.8	5.5	80.6	79.4	m	2-3	2-3
N151	68.8	95.3	63.3	-	101	31.8	21.5	33.2	-	85	8.1	17.7	8.5	3.7	7.5	81.9	80.8	e	2-3	2
N152	70.1	90.2	74.0	-	104	34.6	23.9	34.9	-	91	8.2	26.3	4.5	3.5	8.0	80.2	79.3	m	2	2
N153	66.3	93.0	67.7	-	101	37.8	26.2	37.5	-	99	9.1	30.8	7.0	7.6	8.0	80.2	80.1	mh	2-3	3
N154	72.1	101.2	62.5	-	105	37.5	26.9	32.9	-	95	6.5	11.3	9.0	10.9	6.5	79.3	79.0	me	2-3	2
N155	68.8	91.8	71.1	-	103	33.1	23.5	32.9	-	88	5.5	13.1	7.0	8.1	8.5	81.3	79.5	m	2	2
N158	65.2	88.9	74.4	-	101	36.5	26.3	36.0	-	97	8.5	25.0	7.7	7.4	8.0	82.0	80.3	me	1-2	2-3
N159	67.7	91.1	77.6	48.3	105	37.9	23.6	33.2	19.8	93	7.5	21.4	4.5	5.0	7.5	81.4	79.8	me	1-2	3
N160	65.5	94.8	75.9	-	105	36.3	26.8	33.8	-	95	5.2	13.4	4.5	5.2	8.0	80.4	79.4	m	2	2-3
N161	65.2	94.2	76.0	-	104	35.5	23.8	33.2	-	91	2.5	11.2	4.5	2.8	8.5	81.7	81.0	m	1-3	1
CB4301	68.9	99.2	71.5	-	106	38.6	28.1	35.1	-	100	5.6	15.7	7.0	10.9	6.5	83.4	82.6	me	1-2	1-2
CB4302	68.4	96.1	71.8	-	105	36.2	28.0	35.8	-	98	5.6	14.4	6.7	6.5	8.0	83.7	82.0	me	2-3	3
CB4305	72.5	92.0	78.8	-	108	37.8	29.6	36.0	-	101	7.5	15.1	6.7	6.2	7.5	81.9	79.9	me	2	2-3
CB4308	67.6	95.3	77.8	-	107	37.0	27.8	35.9	-	99	7.1	13.2	5.5	7.9	9.0	84.3	82.9	m	1-3	2-3
CB4311	71.0	103.6	77.4	-	112	39.4	27.5	35.7	-	100	4.5	9.0	6.7	10.7	7.0	81.5	80.0	me	1-2	2-3
CB4313	71.9	92.2	69.1	-	103	37.5	29.5	36.3	-	101	5.8	28.9	6.2	7.2	8.0	82.5	80.7	me	1-2	2-3
CB4323	66.9	92.6	69.6	-	102	32.8	25.0	33.7	-	90	5.6	10.1	7.2	7.4	7.0	82.7	82.3	m	1-3	3
CB4326	70.6	87.5	64.4	-	99	33.1	25.4	33.3	-	90	5.0	12.7	4.5	6.0	8.0	81.7	81.5	m	2-3	2
CB4330	59.4	87.4	77.2	-	99	35.3	27.6	35.0	-	96	5.0	12.7	4.5	2.9	7.5	81.8	80.1	me	2	2
CB4347	64.0	81.6	66.7	40.2	94	29.1	20.6	32.7	13.5	81	5.6	16.7	5.5	6.9	7.5	81.5	80.4	m	2-3	1-2
CB4368	64.6	93.1	72.8	43.4	102	29.4	23.6	32.4	16.4	84	6.5	9.5	5.7	3.7	7.5	83.2	82.3	h	2-3	3
CB4375	64.4	87.8	68.6	-	98	34.7	24.6	34.7	-	92	7.1	12.6	7.7	7.5	7.5	83.5	81.8	e	2-3	2-3
CB4385	65.8	94.6	63.1	-	99	35.8	25.3	35.7	-	95	5.0	11.8	4.5	5.2	7.0	82.3	81.2	m	2	2-3
CB4387	63.8	87.0	69.3	-	98	33.3	25.2	34.5	-	91	5.1	12.5	6.5	3.2	8.5	82.8	81.5	m	3	2
MH608	67.4	79.9	71.5	46.5	97	37.6	24.9	33.6	19.7	94	2.0	0.0	4.5	4.1	-	80.8	79.7	m	1	2-3
MS54-21	62.1	88.6	74.5	44.1	100	44.7	26.4	36.8	19.4	106	9.0	14.9	8.9	5.3	-	81.4	80.6	me	1	2
MS54-27	66.7	96.6	92.6	45.8	113	40.2	26.9	35.9	23.1	101	5.8	11.8	4.5	1.5	-	82.8	82.6	me	1-2	2
MS54-32	58.5	83.3	77.1	43.4	97	42.1	25.8	34.6	15.4	100	5.6	10.4	4.5	2.5	-	79.4	78.2	me	2-3	2
MS54-39	63.1	94.1	78.6	41.8	105	34.9	23.9	33.4	14.8	90	7.0	15.3	6.7	4.1	-	81.6	80.5	m	2-3	2
MS54-40	60.3	87.7	82.2	40.2	102	33.5	25.0	33.7	14.0	90	9.2	15.7	8.9	3.1	-	82.6	81.4	me	3	2
W355	64.8	84.2	76.5	43.6	100	39.5	27.1	35.6	18.8	100	5.5	16.5	2.2	5.3	-	82.9	79.6	me	2	1
MS250	61.4	90.1	87.4	47.0	106	36.0	23.9	31.6	16.2	89	4.9	4.0	2.2	4.3	-	82.5	82.1	m	3-4	2

Table 2. (cont'd.)

Pedigrees			
SD 220	(SD26 x B8)(SD5 x SD48)	CB4308	(W33 x A498)(W79A x A508)
W313	(M13 x R5)(W182B)	CB4311	(W79A x A508)(A90 x A498)
MH803	(CD5 x MS1334)(A509 x A513)	CB4313	(W79A x A508)(A498 x A513)
M135	(A117 x A427)(A509 x A556)	CB4323	(W33 x ND203)(W79A x A498)
M136	(A427 x A556)(A495 x A509)	CB4326	(W79A x ND203)(A90 x A498)
SD250	Sokota 250	CB4330	(CMR5 x W79A)(A498 x A509)
N150	(A90 x A116)(A498 x MS1334)	CB4347	(W33 x ND203)(A498 x A513)
N151	(ND230 x ND203)(CM145 x A498)	CB4368	(W33 x A508)(ND203 x A498)
N152	(ND230 x ND203)(B8 x CQ155)	CB4375	(CM5 x ND203)(W79A x A498)
N153	(ND230 x ND203)(CQ153 x CQ155)	CB4385	(W33 x A90)(W79A x A498)
N154	(CQ503 x CQ573)(CQ153 x CQ155)	CB4387	(CMR5 x W79A)(W33 x ND203)
N155	(ND230 x ND203)(W79A x A90)	MH608	(A334 x A340)(A357 x A392)
N158	(B8 x ND230)(CQ153 x CQ155)	MS54-21	(MS115 x MS211)(B8 x MS114)
N159	(B8 x ND203)(CQ153 x CQ155)	MS54-27	(B8 x MS211)(MS114 x MS116)
N160	(W79A x A90)(SD105 x CM145)	MS54-32	(RM13 x MS1334)(MS210 x MS2A)
N161	(W79A x A90)(SD48 x SD105)	MS54-39	(MS1341 x MS210)(RM13 x MS1334)
CB4301	(W33 x A508)(W79A x A498)	MS54-40	(WD x MS1334)(49 x MS2A)
CB4302	(W79A x A498)(ND203 x A508)	W355	(W9 x WM13)(W153 x W25)
CB4305	(W79A x A508)(A498 x A509)	MS250	(Oh51 x R53)(W10 x MS206)

The Sub-Committee on the Uniform Tests of 400, 500 and 600 maturities sponsored a uniform test of AES hybrids and candidates which included 15 hybrids and involved all three maturities. The data from the tests were assembled and summarized by E. C. Rossman, Sub-Committee Chairman and are reported in tables 3 and 4. Inasmuch as all new candidates included in the 1956 tests were being compared for the first time there were no nominations for AES designations.

Table 3. Average performance for AES hybrids and candidates of the 400 (Wis.464A), 500 (Ohio M15) and 600 (Ohio K24) maturities compared in 1956.

Hybrid	Moisture %		Bushels per acre		Stalk lodging %		Root lodging %	Plants erect %	Maturity rating days	Days to silk
No. of tests	(5)	(7)	(5)	(7)	(4)	(5)	(3)	Ill.	Wis.	Ohio
Wis.464A	20.0	--	75.3	--	22.5	--	1.0	---	100	67.5
Mich.53-175	19.8	--	72.7	--	24.4	20.5	1.6	---	100-5	65.0
Ohio M14	22.0	--	81.9	--	29.2	26.1	0.5	---	105	71.0
AES510	22.5	20.6	85.9	89.2	17.3	14.9	0.6	96	110-15	72.0
AES512	22.3	20.7	92.8	94.3	16.3	14.6	0.9	89	115	71.0
Mich.53-151	21.4	19.8	90.1	93.2	18.6	15.4	1.2	96	110	72.0
CB4603	22.1	20.9	88.2	91.0	17.8	14.9	0.2	99	110-15	71.0
CB4621	21.3	20.0	83.5	87.9	16.6	13.5	0.0	98	110-15	70.5
Ohio K24	23.5	21.6	88.6	91.9	15.2	12.7	0.0	93	115-20	70.0
AES 610	24.6	22.5	88.1	91.8	15.9	13.6	0.0	96	110-15	70.5
Ill.1863	25.4	23.7	92.5	94.7	9.7	8.6	0.1	95	115-20	70.5
Ia.4757	22.9	21.0	94.0	98.6	24.0	21.8	0.7	90	115-20	72.0
Ia.4779	25.0	23.5	89.8	94.1	10.5	9.0	0.0	98	115-20	70.5
Ind.5409	23.0	21.4	93.4	94.6	10.1	8.7	0.0	92	115	72.5
Mich.52-25	23.1	21.5	92.4	96.0	19.8	16.4	0.3	99	110	69.5

	Dropped ears o/o	Corn borer leaf beeding score	Ear hght. 1/ score	ins.	Smutted plants o/o	Shelling o/o	Bird injury o/o	Husk cover score 2/
No. of tests	(3)	Iowa	(2)	Ill.	Ohio	Ill.	Ohio	Ohio
Wis.464A	---	---	---	---	7.7		21.2	1.5
Mich.53-175	8.0	5.5	2.6	---	0.0	---	26.9	1.3
Ohio M15	6.6	5.8	3.6	---	3.8	---	13.5	2.5
AES 510	7.4	6.0	3.1	40	8.0	83	2.0	3.7
AES 512	9.6	6.5	3.5	42	1.0	83	6.7	3.0
Mich.53-151	12.7	5.8	3.7	45	2.9	80	28.8	1.0
CB4603	6.5	6.5	3.7	44	2.9	81	17.6	2.3
CB4621	5.3	6.3	3.5	45	1.9	83	9.6	2.8
Ohio K24	3.3	5.0	3.1	41	10.6	82	27.9	2.5
AES 610	5.0	6.0	2.8	38	2.9	82	18.3	2.3
Ill.1863	4.0	5.0	3.5	42	3.8	79	22.1	2.0
Ia.4757	14.3	6.0	3.5	44	2.9	82	11.5	2.8
Ia.4779	4.7	6.3	3.0	39	1.9	81	19.2	1.5
Ind.5409	4.2	7.0	3.8	41	1.9	81	9.6	3.5
Mich.52-25	5.3	5.0	2.9	36	0.0	82	18.3	1.8

1/ = lowest. 5 = highest 2/ 1 = shortest. 5= longest

Table 3. (cont'd.)

Pedigrees:	Maturities
Wis. 464A (M13-R x W-R3)(W153R x A374)	400
Mich.53-175 (RM13 x MS2A)(MS1334 x MS108)	400
Ohio M15 (Oh51 x Oh26)(A x W23)	500
AES 510 (WF9 x W22)(H19 x B9)	500
AES 512 (WF9 x M14)(B9 x W22)	500
Mich.53-151 (WF9 x MS209)(MS106 x MS107)	500
CB4603 (A295 x W64A)(B14 x A297)	500-600
CB4621 (A295 x W64A)(B14 x A239)	500-600
Ohio K24 (Oh51A x WF9)(Oh33 x Oh40B)	600
AES 610 (M14 x A73)(Oh43 x Oh51A)	600
Ill.1863 (M14 x WF9)(I205 x Oh43)	600
Ia.4757 (WF9 x M14)(B16 x Oh51A)	600
Ia.4779 (WF9 x M14)(Oh43 x Oh51A)	600
Ind.5409 (WF9 x W22)(M14 x B14)	600
Mich.52-25 (WF9 x M14)(Oh51A x MS212	600

State	Yield	Moisture	Lodging Stalk	Lodging Root	Dropped ears	Ear height	Leaf blight
Michigan	X	X	X	X			
Iowa	X	X	X	X	X	X	
Ohio	X	X	X	X		X	
Illinois	X	X			X	X	
Wisconsin	X	X					
Minnesota	X	X	X		X		
Indiana	x	X	X	X			
U.S.D.A.							X

Table 4. Average performance by states and leaf blight ratings for AES hybrids and candidates of 400 (Wis.464A), 500 (Ohio M15) and 600 (Ohio K24) maturities compared in 1956.

Hybrid	Mich.	Iowa	Ohio	Ill.	Wis.	Minn.	Ind.	Leaf blight H.turc. 8/29	Leaf blight H.maydis 8/29
					BUSHELS PER ACRE				
Wis. 464A	59.4	--	78.5	--	112.6	89.0	37	5.0	1.5
Mich.53-175	61.1	66.1	78.7	--	111.9	80.8	31	3.5	3.0
Ohio M15	64.1	81.0	93.7	--	120.4	93.1	38	5.0	3.5
AES 510	69.7	82.1	86.5	113	123.3	103.1	47	5.0	3.0
AES 512	79.4	78.8	94.9	117	132.3	110.5	47	5.0	1.5
Mich.53-151	70.6	86.7	93.1	115	129.1	109.8	48	5.0	1.5
CB4603	68.8	86.7	89.5	109	124.7	108.9	49	4.5	3.5
CB4621	57.7	85.9	85.3	112	122.9	105.7	46	5.0	3.0
Ohio K24	72.9	85.4	95.1	115	123.5	102.7	49	4.5	2.0
AES 610	67.6	91.2	95.8	111	127.5	107.7	42	4.5	2.0
Ill.1863	76.7	83.7	99.0	117	134.8	108.9	43	3.5	1.5
Iowa 4757	72.2	93.2	94.4	127	139.9	108.4	55	3.5	2.5
Iowa 4779	70.5	89.8	89.9	120	135.4	109.0	44	4.0	1.5
Ind. 5409	75.3	76.3	99.2	119	137.3	109.0	46	5.0	2.0
Mich.52-25	76.4	91.6	93.3	118	134.9	107.6	50	3.5	1.5
					MOISTURE o/o				
Wis. 464A	25.0	--	26.0	--	16.4	17.4	15.4		
Mich. 53-175	26.5	18.6	23.8	--	16.2	18.2	14.5		
Ohio M15	29.2	14.9	29.0	--	18.2	18.5	15.2		
AES510	29.5	16.8	29.6	15	19.0	18.6	15.6		
AES 512	28.0	17.2	29.1	16	19.9	18.2	16.4		
Mich.53-151	29.2	15.6	27.0	16	16.8	16.7	17.1		
CB4603	29.3	18.9	27.3	17	19.0	19.2	15.8		
CB4621	27.7	16.6	27.4	17	19.0	17.3	15.1		
Ohio K24	28.5	16.5	30.8	17	21.4	20.0	16.7		
AES 610	32.1	17.2	31.0	17	20.5	21.5	18.0		
Ill. 1863	34.0	20.0	31.7	19	20.5	21.6	19.2		
Iowa 4757	30.2	16.6	28.5	16	20.8	19.2	16.0		
Iowa 4779	32.8	20.3	32.3	19	20.8	21.5	17.6		
Ind. 5409	30.7	19.0	30.3	16	19.3	18.4	16.2		
Mich.52-25	32.3	17.8	29.6	17	17.8	19.8	16.2		
					STALK LODGING o/o				
Wis. 464A	5.2	--	58.7[1/]	--	--	24.1	2		
Mich.53-175	6.7	4.7	73.1	--	--	15.8	2		
Ohio M15	8.6	13.7	66.3	--	--	37.7	4		
AES 510	0.9	5.4	50.0	--	--	15.4	3		
AES 512	4.3	7.7	38.5	--	--	18.3	4		
Mich.53-151	2.3	2.8	59.6	--	--	11.5	1		
CB4603	0.0	3.4	50.0	--	--	20.3	1		
CB4621	1.0	1.3	56.7	--	--	6.7	2		
Ohio K24	3.1	2.7	42.3	--	--	13.3	2		
AES 610	3.8	4.6	42.3	--	--	16.5	1		
Ill. 1863	2.0	4.1	19.2	--	--	15.7	2		
Iowa 4757	6.4	13.2	62.5	--	--	23.0	4		
Iowa 4779	2.9	2.8	26.9	--	--	11.3	1		
Ind. 5409	0.4	3.2	31.7	--	--	7.3	1		
Mich.52-25	1.3	3.2	59.6	--	--	16.1	2		

1/ Rotted stalks

The Sub-Committee on Uniform Tests of 700 and 800 maturities sponsored separate uniform tests in each of these maturities. The test of 700 maturity contained 8 hybrids and was grown in six States. The test of 800 maturity contained 17 hybrids and also was grown in six States. J. H. Lonnquist, Sub-Committee Chairman, assembled and summarized the results from both tests. The data from the two tests are reported in tables 5 and 6. All candidates for AES designations in these tests were being compared for the first time in 1956. None was eligible, therefore, for an AES designation

Table 5. Average performance of the AES hybrids and candidates of 700 (Iowa 4297) maturity compared in 1956.

Hybrid	Acre grain yield1/	Moisture at harvest1/	Days to silk2/	Lodging: Root3/	Lodging: Stalk4/	Dropped ears5/	Ear ht.6/	Blight7/: H. turcicum	Blight7/: H. maydis	Smutted plants8/	Corn borer leaf feeding9/
	Bu.	Pct.	No.	Pct.	Pct.	Pct.	Score	Score	Score	Pct.	Score
Ia.4297 (WF9 x I205)(M14 x 187-2)	91.8	16.4	65	0.2	4.3	6.0	3.2	5.0	2.5	1.4	6.3
AES702 (WF9 x Hy2)(M14 x C103)	98.1	17.4	66	0.9	12.9	7.8	3.4	2.5	1.5	1.4	7.0
Ill.1555A (WF9 x Oh51A)(I224 x Oh28)	92.6	15.5	64	1.8	4.1	9.3	3.3	4.0	3.5	2.0	6.8
Ill.1936 (Hy2 x WF9)(M14 x B14)	95.4	16.6	65	0.5	4.7	6.8	3.4	4.5	2.0	2.4	5.8
Ia.4809 (WF9 x M14)(B14 x B37)	92.0	16.3	64	0.0	1.7	4.8	3.2	4.5	1.5	3.4	6.3
Ia.4879 (WF9 x Oh43)(B14 x B37)	96.6	17.2	60	0.2	1.0	5.3	3.4	4.0	1.5	2.6	5.8
Nebr.1924 (WF9 x Hy)(N6 x B14)	95.9	17.4	65	0.0	3.3	7.6	3.3	4.0	3.0	1.5	5.8
Ohio4317 (WF9 x B14)(Oh28 x Oh43)	57.8	16.4	67	1.1	2.0	4.2	2.9	5.0	2.5	4.0	6.8

1/ Nebr., Ill., Iowa, Mich., Kan., Ind.

2/ Kan., Ind.

3/ Iowa, Mich., Kan., Ind.

4/ Nebr., Iowa, Mich., Kan., Ind.

5/ Nebr., Ill., Iowa, Kan.,

6/ Ill., Iowa, Kan., Ind.

7/ Beltsville

8/ Ill., Ind.

9 Iowa

Table 6. Average performance of the AES hybrids and candidates of 800 (US13) maturity compared in 1956.

Hybrid	Acre grain yield 1/	Moisture at harvest 1/	Days to silk 2/	Lodging: Root 3/	Lodging: Stalk 4/	Dropped ears 5/	Ear ht. 6/	Blight 7/: H. turcicum	Blight 7/: H. maydis	Corn borer: Leaf feeding 8/	Corn borer: Infested plants 9/
	Bu.	Pct.	No.	Pct.	Pct.	Pct.	Score	Score	Score	Score	Pct.
U.S.13 (WF9 x 38-11)(Hy x L317)	87.4	15.6	68	0.5	26.9	15.9	4.0	4.5	3.0	5.5	27.1
AES 801 (WF9 x B7)(B10 x B14)	90.1	15.0	69	0.0	7.6	5.2	3.3	4.0	2.5	6.5	32.7
AES 802 (WF9 x Hy)(N6 x 38-11)	93.8	14.8	66	0.6	15.0	11.4	3.4	3.5	2.5	5.3	32.8
AES 803 (WF9 x 187-2)(N6 x K148)	91.9	15.8	67	1.2	14.5	5.0	3.4	3.5	3.0	5.3	46.2
AES 805 (WF9 x 38-11)(Oh45 x C103)	91.1	15.6	66	1.2	17.8	12.9	3.6	4.5	3.0	6.0	37.7
AES 806 (WF9 xHy)(N6 x N15)	95.4	16.5	66	0.5	20.0	13.5	3.4	4.0	3.0	4.3	43.9
AES 807w(H26 x H27)(H28 x H29)	89.4	15.9	66	0.2	13.4	7.0	3.4	4.0	3.5	6.0	42.0
AES 808 (WF9 x 38-11)Oh43 x H14)	90.6	14.9	66	0.9	23.8	9.1	3.4	4.5	1.5	6.3	35.0
Ind.4656(WF9 x P8)(Oh43 x H14)	89.0	15.9	66	0.0	18.6	5.9	3.3	4.0	1.0	4.3	45.8
Ind.4655 (WF9 x P8)(Oh43 x C103)	91.9	16.1	66	0.1	11.3	3.8	3.3	3.5	0.5	4.8	31.9
Ind.5655(WF9 x H50 38-11(12835) (Oh45 x Oh07B)	91.7	15.7	67	0.7	9.8	7.1	3.4	3.5	1.0	5.3	41.5
Ill.1880 (R103 x R104)(WF9 x 38-11)	87.3	14.1	66	0.8	22.8	18.2	3.6	4.5	1.5	4.5	36.1
Ill.1913 (R151 x R154)(WF9 x 38-11)	91.4	14.7	66	0.9	20.2	14.8	3.7	2.5	2.5	5.3	41.3
Ill.1918 (R151 x R153)(WF9 x 38-11)	89.0	15.8	66	0.6	25.7	12.8	3.6	4.0	2.5	7.0	44.7
Ia.4903 (WF9 x B7)(B14 x B38)	86.6	15.1	67	0.0	9.1	7.2	3.3	5.0	3.0	7.0	33.3
Ia.4912 (WF9 x B14)(Hy x Oh41)	95.6	15.7	66	0.2	19.6	5.9	3.6	4.5	3.0	5.5	27.0
Mo.4060AW (N72 x Mo9187w)(K41 x H30)white	92.4	15.5	66	2.0	10.2	11.0	3.5	3.5	3.0	5.8	-30.9

1/ Ky., Nebr., Ill., Iowa, Kan. Ohio
2/ Ill., Kan., Ohio
3/ Iowa, Kan., Ohio
4/ Ky., Nebr., Iowa, Kan., Ohio
5/ Nebr., Ill., Iowa, Kan.
6/ Ky., Ill., Iowa, Kan.
7/ Beltsville
8/ Iowa
9/ Ohio

The Sub-Committee on Uniform Tests of 900 Maturity sponsored a uniform test of AES hybrids and candidates containing nine hybrids, six yellow and three white. The test was grown in five States and the results were assembled and summarized by the Sub-Committee Chairman, Wm. R. Findley, Jr. The data are reported in table 7. None of the AES candidates in the test was nominated for a regional designation.

Table 7. Average performance of the AES hybrids and candidates of 900 (Mo804) maturity compared in 1956.

Hybrid Designation	1/ Acre Yield: Bu.	1/ Moisture Pct.	1/ Stand Pct.	2/ Root Pct.	3/ Stalk Pct.	4/ Days to 1/2 silk	5/ Dropped ears Pct.	6/ Ear ht. Grade	7/ H. turcicum Score	7/ H. maydis Score	Corn 8/ borer Inf. Pl. Pct.	9/ Smutted plants Pct.	9/ Shelling Pct.
Ill. 1851	81.7	17.5	98	0	6	71	1.6	3.6	3.0	0.5	25.2	1	81
Ill. 1889	77.5	15.7	96	1	8	66	5.1	3.4	3.0	2.5	20.0	4	81
Ill. 1893	80.3	16.3	96	0	4	69	2.2	3.7	3.0	2.5	15.7	1	79
Ill. 1919	73.7	15.0	94	0	6	67	2.6	3.5	2.5	3.0	25.6	3	80
Mo. 916	65.9	19.1	89	1	7	71	0.9	3.6	3.5	2.5	16.9	5	77
Mo. 804	70.2	17.0	92	0	14	71	4.4	3.8	3.0	1.5	16.0	2	81
AES 903W	79.2	17.3	97	1	11	67	2.9	3.5	3.0	3.0	22.2	1	78
AES 904W	76.1	18.3	94	1	7	72	2.8	3.8	3.0	0.0	41.8	5	82
U.S.523W	76.0	17.4	95	1	9	70	4.4	3.6	3.0	0.0	36.8	2	79
Mean	75.6	17.1	95	1	8	69	3.0	3.6	3.0	1.7	24.5	3	80

1/ Ill., Kan., Hopkinsville & Lexington, Ky., Mo., Ohio
2/ Kan., Hopkinsville & Lexington, Ky., Mo.
3/ Kan., Hopkinsville & Lexington, Ky., Mo., Ohio
4/ Kansas, Ohio
5/ Ill., Kansas, Mo.
6/ Ill., Kan., Hopkinsville & Lexington, Ky.
7/ Maryland
8/ Ohio
9/ Illinois

Pedigrees

Ill.1851 (C103 x 38-11) (Oh07 x CI.21E)
Ill.1889 (C103 x Oh45) (38-11 x Oh29)
Ill.1893 (C103 x 38-11) (Oh7B x Oh29)
Ill.1919 (R130 x R156) (WF9 x 38-11)
Mo. 916 (Mo.9108 x CI.21E) (Oh7B x Oh29)
Mo. 804 (CI.7 x K4) (38-11 x CI.21E)
AES 903W (K41 x H30) (K55 x H28)
AES 904W (K64 x Mo.22) (T111 x T115)
U.S. 523W (K55 x K64) (Ky27 x Ky49)

AFTERNOON SESSION, MARCH 5

Chairman Rossman called the meeting to order at 1:00 p. m., and indicated that the afternoon session would be devoted to the reports of standing sub-committees. These reports follow:-

REPORT OF THE SUB-COMMITTEE ON THE PRESERVATION OF GERM PLASM

The Michigan Station is maintaining 32 open-pollinated strains and has just completed a 3-year program renewing seed stocks of them with financial help from Plant Introduction. These appear in Dr. Hoover's list carrying PI numbers 222468 to 222498 and 2224083.

The Illinois Station is preserving the 145 inbred lines that were tested in cooperative tests in 1948. These lines have been increased once since that time.

The Missouri Station has added the following 19 open-pollinated varieties (16 from South Africa) to the list being maintained in that State.

Variety	Source	Description
Potchefstroom Pearl	South Africa	White dent
Early King	"	" "
Mic's Success	"	" "
American white flint	"	" flint
Teko yellow	"	Yellow dent
Robyn	"	" "
Homedale	"	" flint
Yellow Boesman	"	" "
Hotnot	"	" "
Haunschild White	Golden City, Mo.	
White dent	"	
Yellow dent	"	
Blythe Early	South Africa	White flint
Early Pearl	"	White dent
Golden Beauty	"	Yellow flint
Jackson white dent	"	White dent
Sahara	"	Yellow dent
White Boesman	"	White flint
Woodgate	"	" "

Seed of all of these varieties is in storage at the Plant Introduction Center in Ames.

None of the other stations indicated any change in its program of germ plasm preservation.

Dr. Lonnquist suggests further discussion of best methods of propagation of the stocks being maintained. He says "Most of the stocks are regrown using extremely small populations which results in a rather high inbreeding coefficient and I'm afraid loss of many genes of potential future value. We have grown our varieties for increase in small isolated blocks (1500 to 4000 plants usually) every 4-5 years. Since the amount of seed required to plant these is not very great and sampling could result in excessive inbreeding here also, we now harvest approximately 300 ears from an isolation. In shelling, a duplicate composite lot is prepared using 5 kernels from each harvested ear. This composite is used for seed when replanting becomes necessary. We feel that it provides a reasonably good means of maintaining a broad representation from each generation and less chance of losing potentially valuable genes."

The following information is taken from the Report of the Executive Committee of the N.R.C. Maize Committee, dated August 27, 1956.

"The Columbian manuscript (descriptions and classification of varieties in preservation) was ready for publication except for the bibliography. It will contain 120 pages of typescript plus tables, maps, half tones, and diagrams. Publication of the English edition was to be held up about 3 months to allow the Spanish edition to appear synchronously. This was because the same U.S.-made cuts had to be used in both editions.

"The Central American manuscript was in its first draft.

"Writing on the Peruvian collections was expected to begin within a year.

"Dr. Brieger had stated that his first manuscript on Brazilian collections would be ready by December 1956.

"Notices of these publications will be sent to the AIBS Bulletin, Maize Genetics Cooperation News Letter and to other sources."

G. H. Stringfield, Chairman
E. H. Rinke
D. B. Shank

The report was read by Sub-Committee Chairman, G. H. Stringfield who MOVED that it be accepted.

Seconded and passed.

N. P. Neal subscribed to Lonnquist's suggestion for larger samples and indicated that Wisconsin usually grows a large sample when the viability of a variety is being renewed.

There was additional discussion on procedures for increasing seed but no definite action was taken.

REPORT OF THE SUB-COMMITTEE ON THE GROUPING OF INBRED LINES

This committee has been in existence for ten years. The purpose is to list two arbitrary groups of important lines in the Corn Belt so that each group will include widely different maturities and desirable characters. The plan is for breeders to produce new improved inbreds from previous lines crossed within the same group, so that genetic diversity may be maintained in the final crosses for production of hybrids. G. H. Stringfield originally suggested the plan and the success of the Committee should be largely attributed to him.

A short summary of previous committee reports, with page numbers, follows: Ninth Corn Improvement Conference of the North Central Region 11/16/1947, page 25.

" G. H. Stringfield discussed the advisability of grouping inbred lines for breeding purposes. He urged that crosses for the improvement of lines then should be made only among lines of the same group. The object would be to maintain genetic diversity and avoid relationship among lines that later are to be used in production of hybrids." It was moved and passed to study the situation, and the Executive Committee appointed G. H. Stringfield, Chairman, A. M. Brunson, and L. A. Tatum for a Committee on Grouping Inbred Lines for Breeding Purposes.

Tenth Conference 2/11-12/1949, page 45.

The committee recommended that each station submit a list in order that a permanent grouping may be presented at the next meeting of the Conference.

Eleventh Conference 2/3-4/1950, pages 8-9.

The committee presented the first list of 85 inbreds in Group A and 77 inbreds in Group B.

Twelfth Conference 2/15-16/1951, page 10.

The committee gave a short report, and no new lines have been added since 1950.

Thirteenth Conference 2/5-6/1953, pages 15-16.

The committee presented a revised list of 113 lines in Group A and 98 lines in Group B. Obsolete lines dropped, 4 in Group A and 1 in Group B. New lines added, 30 in Group A and 25 in Group B. I.159, L289, and Os426 changed from Group B to Group A, and K64 changed from Group A to Group B.

Final Conference 3/4-5/1954, page 21.

The committee gave a short report with no revised list of lines.

North Central Corn Breeding Technical Committee 3/1-2/1955.

No report

North Central Corn Breeding Technical Committee 3/6-7/1956, page 18.

No report

There are a number of new inbreds since the last list assigned to Group A and Group B. Copies of the list (Thirteenth Conference page 16, 1953) were distributed to the members with a request that each State list its new inbred lines and indicate the group to which they should be assigned. The previous list may have some now obsolete lines which should be indicated so that they can be discarded from the list. We hope that each of your State representatives will send his list to the Chairman of this committee by March 15 so that the complete revised list can be included in the committee report. (The revised list is given below.)

Since L. A. Tatum is no longer a member of the North Central Corn Breeding Technical Committee a third sub-committeeman should be appointed.

A. M. Brunson, Chairman
N. P. Neal

Group A			Group B		
AC14	A265	B6	A7	A208	B10
A15	A277	B7	AC11	A239	B14
A25	A295	B8	A12	A250	B21
A34	A334	B9	A21	A286	B37
A71	A344	B9A	A73	A297	B38
A90	A374	B16	A96	A311	B43
A158	A375	B18	A111	A322	B44
A165	A385	B36	A116	A340	B45
A171	A395	B41	A131	A347	B46
A188	A498	B42	A148	A357	B47
A218	A509	Ia.153	A166	A392	
A223	A513	Ia.I.159	A203	A508	
A254		Ia.I.205	A204		

Group A			Group B		
Ia.I.224	Ky.21	R59	CI.3	ND5	W26
Ia.I234	Ky.27	R61	CI.3A	ND30	W59E
Ia.L289	Ky.49	Ill.4226	CI.4-8	ND167	W-M13
Ia.L317	Ky.122	Ill.A	CI.5	ND211	W18/2
Ia.Os420		Ill.L	CI.21	ND283	
Ia.Os426	L97		CI.21A		
	L503	SD48	CI.27	NYD1100.3	
C103		SD102	CI.28A		
	MolW	SD105	CI.42A	Oh02	
CI.2	Mo2RF	SD107	CI.64	Oh07	
CI.7	Mo3		CI.540	Oh7A	
CI.31	Mo21R	W8		Oh7B	
CI.38B	Mo22	W10	H5	Oh7K	
CI.187-2	MoG	W16	H19	Oh7N	
CI.317B	MoL3	W23	H21	Oh26	
		W25	H23	Oh26A	
H14	N6	W28	H28	Oh26C	
H22		W32	H31	Oh26D	
H30	NC7	W187R	H41	Oh26F	
H45		W-R3	H42	Oh28	
H46	ND1	W37A	H55	Oh29	
H49	ND36	W41A	H56	Oh33	
H50	ND203	WD	H59	Oh51	
H51	ND230	WH	H60	Oh51A	
H52	ND255	WJ	Ind.B2	Oh56	
H53		W64A	Ind.P8	Oh56A	
H54	Oh04	W75	Ind.Pr-1	Oh431	
H57	Oh4C			Oh451/1	
H58	Oh5		K4	Oh7L	
H60	Oh40B		K44	R30	
Ind.33-16	Oh41		K55	Ill.90	
Ind.38-11	Oh43		K64	Ill.5120B	
Ind.66	Oh45		K155	Ill.Hy	
Ind.B164	Oh65		Kys	Ill.Hy2	
Ind.Tr	Oh67			Ill.M14	
Ind.WF9	Oh84		MS1		
	Oh422		MS24	SD26	
K6	Oh425		MS206	SD104	
K41	Oh460		MS1334	SD106	
K63	Oh480		MS1341		
K148				W9	
K150	R2		NC34	W22	
K201	R4			W24	

1/ Related to both groups, Oh04 and K155
2/ Related to both groups, WD and W22

The Sub-Committee report was read by Dr. Lee House who MOVED that the report be accepted.

Motion seconded by G. F. Sprague and passed.

W. A. Russell raised a question about assigning the various synthetics to breeding groups. This question was discussed but no definite action taken.

REPORT OF THE SUB-COMMITTEE ON CYTOPLASMIC MALE STERILITY AND RESTORERS

Tentative standards for the use of recovered restoring inbreds were set up at the meeting of the International Crop Improvement Association at Salt Lake City last November. Although copies of the discussions are not available, the certification requirements being considered are approximately as follows:

1. A pollen restoring line may be substituted for its non-restoring counterpart in a foundation single cross, provided the pollen restoring line is the same in other characteristics as its non-restoring counterpart.

2. To be eligible for certification, a recovered pollen restoring inbred must have been backcrossed to its recurrent parent with selection for pollen restoration, relative to a specific cytoplasmic sterile source, for not less than five generations. At least one generation of selfing, subsequent to backcrossing, will be required to fix the fertility restoring gene or genes in a homozygous condition. Proof of the fertility restoring ability of each line will be supplied by the originator.

3. In addition, it is the feeling of Crop Improvement personnel that the name of the inbred into which a restorer gene or genes has been incorporated should not be changed except to add the proper designations to indicate the presence of the restorer factor for a particular source of sterility.

It is evident that no specified number of backcrosses will ensure the recovery of lines differing from the original only in restorative action. Moreover, slightly different restorer versions of certain inbred lines will likely be released from several sources. For these reasons it might be best to assign a new number to each restorer produced. The use of such new numbers would reduce the likelihood of confusing the various restorer versions and also the restorer and non-restorer versions.

However, a consideration of the problems confronting the Crop Improvement Associations may well lead to other conclusions. When a recovered pollen restoring inbred is indistinguishable from the original, and presumably performs approximately the same in combination, a simple designation, such as HyR, would simplify the inspection and marketing of recovered lines and their single crosses.

In view of this trend in the Crop Improvement Associations, it seems advisable for this group to decide whether recovered restorer inbreds should be given new State numbers, as has been favored at some experiment stations, or to go along with the Crop Improvement Associations in their preference for a simple designation, such as HyR, which retains the title of the original inbred.

J. B. Beckett, Chairman

After reading the report Dr. Beckett MOVED that it be accepted.

Seconded and passed.

REPORT OF THE SUB-COMMITTEE ON COOPERATIVE MATURITY STUDIES IN 1956

Except for the month of June, the 1956 corn growing season was very cool and maturity of corn much delayed. East Lansing reported over 400 growing degree days below normal and Spooner over 100 growing degree days below normal for the 1956 corn maturity trial studies. There was a difference of three weeks in the planting dates for the two trials.

It does not seem that growing degree days are going to lend themselves as a useful method in assigning definite maturities to corn hybrids. A difference of 400 growing degree days exists between the seven trials for a four year period, to mature a given hybrid.

The use of the moisture content of ear corn at harvest seems to be the best method for assigning maturities to corn hybrids.

Since the number of days from planting to the maturity of corn in the Northern regions can vary as much as 20 to 25 days between years, the assignment of so many maturity days to a hybrid can only be a relative maturity value.

Individual hybrids perform very satisfactory in several States. If a maturity rating is to be assigned, it is feasible and practical that such a relative maturity rating should be used in all the States.

Minnesota has a very extensive maturity testing program for the purpose of assigning relative maturities to hybrids. The relative maturities assigned to the eight hybrids tested in the maturity studies the past four years, agrees pretty well with the data obtained in the maturity studies except for the two late hybrids tested.

A. M. Strommen, Chairman
E. H. Rinke
E. C. Rossman
William Wiidakas

A. M. Strommen presented the report of the Sub-Committee and distributed copies of the data obtained on the maturity studies conducted in 1956. A summary of the results on 8 hybrids studied for 3 years is presented in table 8.

Following the discussion of the 1956 data Mr. Strommen MOVED that the report of the committee be accepted.

Seconded and passed.

Table 8. Summary of the results from maturity studies with 8 hybrids for 3 years.

Hybrid	Wis. R.M.	Minn. R. M.	Maturity ratings in 7 trials in 4 years: Rating	Trials	Ratings	Trials	Spooner data only — Moisture content of ear corn at 2 harvest periods. Av. of 1953, 1954 & 1956: 3rd harvest Sept. 15	5th harvest Oct. 2
Morden 77		78-82	1st	7			36.6	24.3
Wis.240	80	82-86	2nd	4	3rd	3	36.5	28.4
N.D.301		84-88	2nd	3	3rd 4th	3 1	38.7	26.9
Wis.255	80	82-86	4th	6	3rd	1	39.9	27.8
Wis.279	85	86-90	5th	6	6th	1	42.2	29.7
Wis.275	85	90-94	6th	6	5th	1	43.9	32.8
Minn.608		99-103	7th	4	8th	3	50.4	35.6
Wis.355	90	93-97	8th	4	7th	3	48.5	37.3

THE NEED FOR ESTABLISHING, IF POSSIBLE, A UNIFORM SYSTEM OF DETERMINING MATURITY CLASSIFICATIONS

N. P. Neal

In the northern Corn Belt, the greatest single hazard to corn production is the danger of an early frost. In Wisconsin for example, a State-wide killing frost for corn normally occurs about mid-September, and in the northern half of Wisconsin, frosts frequently occur even earlier.

Experience shows that the optimum planting time is mid-May for southern Wisconsin, while it is often later in many sections further north. Soils usually are too cold for establishment of satisfactory stands when planting is done earlier than indicated and there is the further risk that even though emergence may be obtained with earlier planting, it will be retarded, though probably not killed, by frosts occurring occasionally as late as the end of May.

The average available frost-free period then, imposes rather strict limitations on the maturity of corn that should be planted under such conditions. A further important limitation is the purpose for which corn is grown in northern areas. Whereas 10 to 15 years ago, 50 percent to 60 percent of all corn grown in Wisconsin was for silage production, there has been a gradual change until today, on the average, 60 percent is planted for grain production. In the southern counties, the proportion of the corn crop used as grain may approach 75 percent in favorable seasons.

If ear corn is to be stored in cribs, the moisture content should not exceed 20 percent when cribbed. If it is to be used as silage, it should be ensiled before it passes the medium dent stage of maturity and most importantly, before it has been frosted. The increasing importance of corn in the agricultural economy of Wisconsin is shown by the fact that the corn acreage continues to increase and approached 2 3/4 million acres in 1956. That corn has been able to assume this greater significance is a direct consequence of the success achieved in breeding early maturing hybrids with good agronomic qualities that are suitable for grain production even in the northern sections.

For all these reasons, it is apparent that the planting of corn with appropriate maturity is a consideration of paramount significance. Such being so, it is equally obvious that a system of maturity designations is needed that will mean the same thing over a large area. At present, no such system prevails. The several States, as well as individual seed companies, while recognizing the importance of maturity, each has devised its own scheme of maturity classification, which often bear little relation to each other, and in most instances, to reality. Consequently, considerable confusion exists in the central and northern Corn Belts in respect to maturity ratings of hybrid corn. Maturity ratings assigned to varieties have little meaning, unless it is known where these ratings are determined.

A strain assigned a 100-day maturity in the central Corn Belt certainly will be an entirely different kind of corn from one similarly classified in Minnesota or Wisconsin and vice versa. Even in similar latitudes, there are many examples of both public and private hybrids having widely variable ratings in adjoining states. Some people will contend, with justice I believe, that such confusion often results in an unjustified discrimination against these strains in one area or another.

The confusion of which I speak results from several causes. One is the attempt to express maturity as a specific number of days, or a range of days, from planting, or from emergence, to maturity. The length of time, or the number of days, required for a variety to reach full maturity is influenced by many factors, such as:

(1) The hereditary composition and the order in which the parental inbred lines occur in the pedigree. Considerations such as the degree of susceptibility or resistance to stalk rotting diseases, the thickness of the cob, and the rate at which moisture moves from the cob through the kernels in the drying out period, doubtless have a significant influence on time of maturity.

(2) The character, texture and moisture holding capacity of the soil.

(3) The availability and balance of fertility.

(4) The amount and distribution of moisture supply throughout the growing season.

(5) The length of the effective growing season and the mean daily temperature throughout. It is of interest to note in this connection that a strain that will mature in an effective growing season of 80 days in northern Wisconsin may require 150 to 170 days in north-western Europe where the growing season is much longer, but where summer temperatures are consistently lower.

(6) The kind of weather prevailing during the maturation period. On the average 45 to 55 days from pollination are required for corn kernels to reach maximum dry weight i.e. when the moisture content is around 40 percent. A warm, dry atmosphere with wind, as prevailed in 1956, favors the drying out process after this point has been reached, while cool, moist conditions retard it.

These and other factors will vary from farm to farm and season to season, and it is impossible to state precisely the actual number of days that will be required for a given variety to reach maturity under a given set of circumstances. Though it is acknowledged that corn breeders as well as farmers traditionally tend to associate a specific number of days to a given variety in respect to maturity, it must be admitted that the custom often is extremely misleading and is far from satisfactory in areas where adequate maturity is of primary significance and importance.

In Wisconsin and in recognition of the difficulties involved, attempts have been made to express maturity on a <u>relative</u> basis. Wisconsin maturity ratings refer to <u>relative maturity</u> rather than to the number of days. The ratings of the various hybrids are relative to each other. A strain with a rating of 100 R.M. is earlier maturing than one of 105 R.M., but later than one of 95 R.M. when grown under the same conditions. It is admitted that the numerical designations used are a carry-over from an earlier practice in which the same numbers referred to days. It is also granted that the

Wisconsin system of determining maturity ratings tends to be somewhat arbitrary, but on the whole, the system, though leaving something to be desired, has worked reasonably well within the State. A particular difficulty arises when seed produced in Wisconsin, or elsewhere, moves in interstate channels into areas where a designation of maturity as determined in those areas in required by law, as in Minnesota, to be printed on the tag.

Thus it is entirely probable that a given strain can have two, or even more official maturing designations which also could be changed from year to year. This occasions major problems not only to seed certification services in respect to proper labelling, but also to seedsmen whose commerce extends into several States.

Some northern corn workers are of the opinion that commonly used standards such as date of 50 percent silking and moisture content of the kernels at harvest are not in themselves infallible criteria for determining comparative maturities of different strains. Useful and indicative though they may be in a general way, they do not serve the purpose adequately.

In recent years, as has been reported at this conference, attempts have been made in some of the Northern States, as well as abroad, to approach this important problem from a different angle. The method involves the determination of degree-day thermal units required from planting to the stage of maturity when the kernels reach maximum dry weight, i.e. when the ears contain about 40 percent moisture. Only temperatures above 50°F. are considered effective in the calculation of thermal units available for the growth of corn.

The reasoning behind this approach was that a given strain would require approximately the same number of thermal units to reach maximum dry weight, irrespective of where it was grown as well as being reasonably constant from season to season.

Preliminary summaries of the number of degree-day thermal units required to mature a specific strain to 40 percent moisture do not show the measure of uniformity anticipated. There is a considerable variation between different stations in a given season and between seasons. In the past thermal units have been calculated from time of planting. It is conceivable that a greater degree of uniformity would be obtained if time of emergence was used as a base, rather than planting time.

In spite of the lack of uniformity in the number of thermal units mentioned above, it is of particular interest that there is a close agreement in the order that hybrids reach the 40 percent ear moisture stage of maturity in relation to each other. In other words, the relative maturity of the several strains involved in these trials is essentially the same, irrespective of where the trials are made. This suggests that it should be feasible to assign relative maturity ratings to hybrids that would be uniform for several States. The accomplishment of such an objective would be of material benefit to all concerned with seed corn industry.

The number of thermal units required between date of 50 percent silked and physiological maturity at 40 percent ear moisture appears to be relatively stable for all hybrids, though some interesting differences have been noted. It is possible that these differences may be associated with differences in stalk rot susceptibility, the degree to which the husks open during the maturation period, and the differential rates at which the ears dry out. Many are convinced that there are gross differences between hybrids in their rate of drying after physiological maturity. If this be so a system of maturity ratings based solely on physiological maturity does not satisfy the farmer's needs. A more accurate method perhaps would be one based on the time required to reach "cribbing maturity" i.e., 20 percent or 21 percent ear moisture.

The major divergence between strains in respect to thermal-unit requirements occurs in the period from emergence to silking. Aside from the factors already mentioned as influencing growth rate, there may be another, viz. light intensity and the efficiency of light utilization, that may be responsible for some of the variations noted. This aspect has not been investigated in the current studies. To do this most effectively would require growth chambers in which the duration and intensity of light could be accurately controlled.

Because of the problems and confusion presently prevailing in respect to maturity classification, there is a growing interest developing in the seed corn industry in respect to the kind of approach outlined in this discussion. Preliminary talks already have been held with certain of the larger seed corn companies and there is reason to believe that some of them at least would be willing to participate in the conduct of these trials if the experiment stations would show an equal interest. Several of the northern experiment stations have taken an active part in the investigations to date. It is believed also that such studies may be of equal interest to workers in the central Corn Belt and perhaps lead to a solution of a problem that is of greater significance than may be realized at present.

Cooperation of industry and station workers in investigations of this kind is to be desired. If industry participates in the development of a uniform system of maturity designations, it will have a greater interest in accepting it.

In conclusion, I believe it is feasible to develop a uniform and a more satisfactory basis for maturity classification than presently prevails. I am convinced that any new procedure should be completely divorced from, and have no reference to the designation of maturity in terms of a given number of days.

The maturity classifications already in use in the North Central States for the cooperative testing programs and involving nine major series from 100 to 900 probably could form the basis of a numbered system that would be useable throughout the corn growing areas of the central and northern Corn Belts, and if extended somewhat even in southern regions.

With such a system of relative maturity designations it should be possible with the cooperation of breeders and industry to envision a hybrid designation system of numbering that would conform to the maturity classification. Once such a plan became established, it would then be feasible to relate the hybrid designation directly to its relative maturity, and farmers would have a rather precise knowledge of the relative maturity of a given strain irrespective of who merchandized it.

A standardization of the kind I have discussed is not an impossibility, if there is willingness on the part of all concerned to achieve it. A large degree of standardization has been accomplished in the fertilizer industry, for example, and has been of great benefit to farmers as well as to the industry. I am convinced that a uniform system of maturity classification would be of even greater benefit to our corn enterprise. I trust that corn workers in the experiment stations of the north central region will be willing not only to endorse such a program as suggested but also to participate actively with industry in carrying it through.

* * *

Following Dr. Neal's report there was a discussion of procedures that might be used to develop a uniform system of classifying hybrids for maturity. Dr. Neal proposed that we enlist the support of industry in studying the general problem and suggested that the stations cooperate in selecting a group of hybrids for observation in uniform plantings. The Chairman asked Dr. Neal to prepare a statement and motion covering the objectives he had in mind.

REPORT OF THE PROPOSED PLANT BREEDING STATION IN THE SOUTH FOR THE NORTH CENTRAL REGION

N. J. Volk

To go back to the beginning, the Directors acted on the request made by the Corn Breeding Research Committee and appointed Director Shirky, Chairman, Director Frolik, and me at the Spring meeting in 1956. We were to make a report to the Directors at their summer meeting. However, Director Shirky did not attend the Summer meeting and neither Frolik nor I had been filled in on what Shirky had done. The Florida station had been contacted and offered their cooperation, but were not interested in being directly involved in the venture since private growers now contracting with Northern States might be critical if the Florida station attempted to set up facilities to do the job. Doctor Quisenberry stated that the Cereals Research Branch was willing to help - they have men at both Belle Glade and Fort Lauderdale.

Finally, as a result of a meeting in Lafayette attended by Frolik, Shirky, and me, we formulated the following report to the Directors:

1. That a technical committee be established to develop and present a regional project, including budget, the purpose of which is to provide land and facilities in southern areas suitable for accelerating the plant breeding program of the North Central States.

2. That this committee be composed of two representatives, one from field crops and one from horticulture, from each station and from the Agricultural Research Service, in addition to the usual State Experiment Stations Division representatives.

3. That travel funds be provided for meetings of this committee to develop the project, and that the amount provided be sufficiently large to permit inspection of areas by a representative sub-committee of the technical committee. It is recommended that the sub-committee consist of two representatives from field crops, two from horticulture, the chairman of the technical committee, the administrative advisor, and two representatives from A.R.S., in addition to the usual S.E.S.D. representatives.

4. It is recommended that a budget of $10,000 be provided to cover travel and all other costs of this committee.

Director Shirky reported the above four points to the North Central Directors at the November 10-11 meeting in Washington, D. C. The Directors took the following action: "It was moved and passed that the North Central Directors approve recommendations as proposed by Director Shirky in his September 11 letter and refer this action to the Committee of Three for consideration and for recommendations regarding the allocation of funds for the support of the project at an early date. Also, authorization was given for the appointment of an administrative advisor and a regional technical committee to set up and develop a project in accordance with suggestions of the Shirky report."

As far as I have been able to determine, the administrative advisor was not appointed by Dean Weber, then chairman of the North Central Directors, and consequently the technical committee has not been named or organized. The necessary action will probably be taken at the Spring meeting of the Directors, March 18 to 20.

REPORT OF THE SUB-COMMITTEE ON WINTER NURSERIES

The winter crops in the Homestead area and at Lake Worth were exceptionally good as a whole.

A field of 38 acres near Homestead under the management of August Burrichter included plantings for Indiana, Michigan, Wisconsin plus several private companies.

Illinois and several commercial companies were on the Peterson Farm near Burrichter and conditions also were favorable on this farm. Missouri, Mississippi, Tennessee and private companies were on the Blake farm about 2 miles north of Burrichter's. Mr. Burrichter told us that he would like to move farther north to get away from the military airport.

Minnesota, Pennsylvania, Iowa, Kentucky, Ohio, and Clyde Black and Son had 11 acres on the Bauer farm at Lake Worth. Several inbred lines planted at approximately the same date at Lake Worth and Homestead were in flower perhaps a week earlier at Lake Worth but we thought they had made more vigorous growth at Homestead. Mr. Bauer, at Lake Worth said he would discontinue his sweet corn and provide 20 acres annually for corn breeding plots if the demand arose. We have recommended some changes in his equipment which now is designed for low growing crops.

A trial planting including material from several Corn Belt and Southern States, was made on the Florida substation at Ft. Lauderdale, - about half way between Lake Worth and Homestead. Corn growth was approximately comparable to that at Lake Worth.

G. H. Stringfield, Chairman
A. M. Strommen
E. H. Rinke

REPORT OF THE SUB-COMMITTEE ON THE USE OF STATION LINES IN THE HYBRID SEED CORN INDUSTRY

During the past year the Sub-Committee contacted Mr. Wm. Heckendorn and several members of the hybrid seed corn trade regarding the possibility of obtaining information on the commercial use of inbred lines released by the State Agricultural Experiment Stations and the U. S. Department of Agriculture. All of the individuals contacted were interested in the possibility of obtaining such information and Mr. Heckendorn offered to cooperate in a survey of the industry by mailing out the questionnaire from his office.

During December and January the Sub-Committee contacted all of the State Agricultural Experiment Stations and obtained a list of the inbred

lines released during the years 1946 through 1955. A total of 156 inbred lines were released during this 10-year period. Mr. Heckendorn was supplied with a list of these lines on February 6 and questionnaires requesting information on the use of these lines in the production of double crossed hybrid seed of the 1956 crop were mailed to members of the hybrid seed corn trade on March 7. A total of 52 replies have been received from 12 states as follows:

Georgia	1	Nebraska	1
Illinois	17	New York	1
Indiana	7	Ohio	5
Iowa	6	Virginia	2
Minnesota	6	Texas	1
Missouri	4	Wisconsin	1

The replies have been summarized and the results are reported in table 9. Of the inbred lines released during the past 10 years the 9 most extensively used in 1956 were C103, Oh43, B14, R61, Oh41, Oh45, P8,W22 and W153R.

Merle T. Jenkins, Chairman

Table 9. Inbred lines released from 1946 through 1955 and the total number of bushels of double crossed hybrid seed of the 1956 crop of which these lines were a parent.

Lines	Bushels of seed	Lines	Bushels of seed
Lines released in 1946			
H21	29,800	A305	--------
H22	------	A308	--------
H23	-------	A310	--------
K6	-------	A312	--------
P8	190,200	W-D	18,042
K55	38,000	W-H	1,837
K64	83,900	W-J	--------
K155	27,250	W-9	57,923
K201	16,400	W-16	81,200
A7	-------	W-22	180,840
C-11	-------	W-23	43,600
" Impr.	-------	W-25	9,108
A12	-------	W-26	400
C14	-------	W-49	11,337
" Impr.	-------	W-M13	12,900
A15	-------	W-R3	17,596
A21	-------		
A25	1,500	Lines released in 1947	
A71	-------		
A73	61,165	R59	---------
A96	11,434	R61	191,052
A116	12,300	W28	20,000
A131	-------	W32	46,600
A148	685	W33	3,700
A158	1,530		
A165	3,107	Lines released in 1948	
A311	-------		
A322	-------	B8	86,371
A334	88,172	K41	------
A340	66,000	K63	------
A344	56,822	ND167	------
A347	-------	ND203	9,641
A357	9,644	ND211	------
A374	13,633	ND230	8,016
A375	74,680	ND255	4,200
A385	8,211	ND283	------
A392	5,300	A90	25,016
A395	800	A111	13,816
C15	-------		
C16	-------		
C19	-------		
C20	-------	Lines released in 1949	
A34	-------		
Imp. 91	-------	C101	------
A166	-------	C102	1,400
A171	-------	C103	885,731
A188	-------	C104	------

Table 9. (cont'd.)

Line	Bushels of seed
1949 cont'd.	
C105	1,000
C106	10,000
C107	----
Oh41	190,610
Oh43	619,246
Oh45	190,000
Lines released in 1950	
Co-M49	----
Co-R19-8	----
K148	13,500
K150	13,500
ND1	----
ND5	----
ND30	----
ND36	----
SD5	----
W8	17,400
W20	----
W24	----
Lines released in 1951	
W-M13R	60,808
Lines released in 1952	
N1	2,000
NY1	----
NY2	----
NY3	13,000
NY4	----
CI.21E	23,572
Lines released in 1953	
B6	29,950
B7	15,928
B10	25,603
B14	297,137
B16	7,020
N15	59,052
Oh5	25,080
W153R	122,639
W22R	10,700

Line	Bushels of seed
Lines released in 1954	
NY16	4,500
CV3	1,100
W41a	11,943
W59E	11,943
W64a	1,400
W75	11,943
W79a	12,650
W187R	11,000
CI.27	13,000
Lines released in 1955	
F6	84,000
F44	84,000
GT112	84,000
R53	----
R71	----
R109B	----
R113	----
R168	----
MS24	----
MS206	2,000
A203	1,500
A208	500
A218	5,711
A223	4,000
A286	14,611
A295	----
A401	17,450
NC7	3,000
NC13	3,000
NC33	----
NC34	----
Oh7A	22,000
Oh56A	----
W37a	17,928
W182B	36,239
W182D	----
CI.38B	----
CI.42A	----
CI.64	----
CI.317B	----

Grand total 4,738,022

REPORT ON WITCHWEED

M. T. Jenkins

On September 21, 1956, Dr. R. R. Nelson of our Section wrote me that a parasitic plant damaging corn in North Carolina had been identified as a species of Striga, probably S. lutea. This plant, commonly referred to as witchweed, has previously been known in Africa, Australia, and India but has not previously been reported as occurring in the Western Hemisphere.

In view of the importance of Striga as a pest on corn in South Africa a meeting was arranged on October 2, 1956. It was attended by members of the Agricultural Research Service and members of the Crops Regulatory Programs and the known information on Striga and its distribution in North Carolina was reviewed. Following this meeting there were conferences with members of the North Carolina Department of Agriculture and the North Carolina Experiment Station. From October 15 to November 2 the Plant Pest Control Branch, ARS surveyed several counties in North and South Carolina to obtain preliminary information on the extent of the distribution of witchweed. The survey indicated that witchweed was present in Bladen, Columbus, Cumberland and Robeson Counties of North Carolina on a toal of 79 farms and in Dillon, Horry, Marion and Marlboro Counties in South Carolina on a total of 38 farms.

The Pest Control Branch emphasizes that the survey was made so late in the season that only heavily infested fields could be identified. For this reason the results should be interpreted with caution as many areas with light infestation probably were not detected.

Striga seems to do best on relatively light sandy soils, although it is known to occur on heavier soils. Relatively little information is available at the present time as to how well it may be adapted to the soils and environment of the Corn Belt. It would seem to be very well adapted, however, to all of the soils of the Eastern Coastal Plains. Although it has been known in Africa for many years it apparently does not exist in Europe.

Striga seeds are microscopic and a single plant may produce as many as 500,000 seeds. These small seeds are easily disseminated by a variety of means. They may be blown by the wind, carried by water, or transported much longer distances in soil attached to crop plants or plant parts. Crops such as sweet potatoes, peanuts, onions or anything of this kind which may have particles of soil adhering to them should be capable of transporting the seed. The shipment of tomato plants from the Coastal Plain regions of the Southeast to the Corn Belt could be a serious source of infestation if witchweed were to become established in the area where these plants are grown.

A meeting to consider the establishment of a Federal Striga quarantine was held in Washington on January 30th and a second meeting was scheduled to be held on March 5th.

REPORT ON THE D. F. JONES PATENT
M. T. Jenkins

At the recent meeting of the Northeastern Corn Improvement Conference Mr. S. Blake Yates, Director, Patent Development Division of Research Corporation presented general information on Research Corporation, the Jones Patent and outlined some of the thinking of Research Corporation in the administration of the patent.

According to Mr. Yates, Research Corporation is a non-profit foundation organized by Dr. F. G. Cottrell in 1912 who endowed it at that time with his patent rights in the field of electrical precipitation. Dr. Cottrell was a chemist and his ideas in organizing Research Corporation were to provide a means for advancing science by contributing to scientific and educational institutions, provide a means for handling inventions more readily than had been possible in the past and to distribute the proceeds for the support of scientific research.

Research Corporation now has arrangements with more than 90 universities and research institutions for handling patent arrangements. In general, Research Corporation receives about $42\frac{1}{2}$ percent of the royalties. The remaining $57\frac{1}{2}$ percent goes to the research agency with some of this going to the inventor.

In 1935 Dr. R. R. Williams and Dr. R. E. Waterman assigned certain patents covering the synthesis of vitamin B1 to Research Corporation and set up a fund known as the Williams-Waterman fund for the endowment of research in the field of nutrition. Total grants of Research Corporation have been somewhat in excess of one million dollars per year.

Mr. Yates indicated that in 1949 D. F. Jones and P. C. Mangelsdorf came to Research Corporation with plans for patents on the use of cytoplasmic sterility in the production of hybrid seed corn. Two patents, one covering the use of cytoplasmic sterility and another on the use of restorers were assigned to Research Corporation. The arrangements provide for distribution of any royalties between Drs. Jones and Mangelsdorf, The Connecticut Agricultural Experiment Station, Harvard University and Research Corporation. Part of Research Corporation's funds are to go to an Edward Murray East fund to be administered in the same general manner as the Williams-Waterman fund. The Edward Murray East fund is to be administered by a committee of three, one member to be appointed by Jones, one by Mangelsdorf and the third by Research Corporation.

Patent No. 2,753,663, covering the use of restorers, was granted on July 10, 1956. The patent covering the use of cytoplasmic sterility has not yet been granted. An appeal on the application for this patent is to be heard before the U. S. Court for the District of Columbia about a year from now.

Research Corporation has in mind establishing a licensing arrangement in which about 20 to 25 percent of the savings through the use of cytoplasmic sterility and restorers would be paid as a royalty by the seed producer. Mr. Yates indicated that Research Corporation hopes to announce a definite policy on licensing sometime within the next month. He indicated that they have had conversations with many people in research and industry regarding royalties but have been thinking in the general terms of a royalty of 5¢ per bushel for each patent. Mr. Yates indicated that this is their first experience with a process patent in this general field and Research Corporation is proceeding with considerable caution in developing a licensing policy.

Following Mr. Yates presentation he was questioned in considerable detail regarding various procedures and policies. In these discussions it was brought out that both Dr. Jones and Mr. Yates felt that the patent was sufficiently broad enough to cover the use of an F_2 pollinator. Representatives from New York indicated that they plan to distribute seed stocks for the production of NE310, a new three-way hybrid utilizing both cytoplasmic sterility and a restorer for seed production in 1957. They were interested in learning what arrangements their prospective seed growers would be required to make with Research Corporation. Mr. Yates indicated that he would be glad to have them write him regarding licensing and hoped that Research Corporation would have their licensing policy developed in the near future.

The meeting adjourned at 5:10 p. m.

MORNING SESSION - MARCH 6, 1957

Chairman Rossman called the meeting to order at 9:05 a. m., and indicated that the first item of business would be the reports of the sub-committees on the uniform tests. These reports follow.

REPORT OF THE SUB-COMMITTEE ON UNIFORM TESTS OF 100, 200 and 300 MATURITIES

The 36 single crosses among 9 inbred lines of 300 maturity were cooperatively tested in 1956 in Michigan, Minnesota, North Dakota and Wisconsin. The data from these tests are summarized in tables 10, 11, 12 and 13.

No observational plantings of inbred lines or yield tests of single crosses were scheduled for 1957. It was the feeling of the Sub-Committee that each station was overcrowded with their own material and that new lines were not yet sufficiently evaluated at home to warrant including them in regional tests.

Two groups of AES hybrids and candidates will be compared in 1957. These are listed below.

100 and 200 maturity series - 8 entries

		Minn.	Mich.	N.Dak.	S.Dak.	Wis.	Corn Borer Lab.
Type hybrid Wis.240							
(WD x ND203)x(CV3 x W103)	AES101	1					
(W33 x A116)x(A90 x ND203)	AES201	1					
(CD5 x W59M)x(A509 x MS1334)	AES202	1					
(CD5 x A509)x(W59M x MS1334)	AES203	1					
	Wis.					2	
	Wis.					2	
(A495 x A509)x(A502 x A556)	Minhy.804	1					
Seeds requested		540	500	800	500	150	100

Seed shipped from Minnesota 1, Wisconsin 2.

300 maturity series - 7 entries

		Minn.	Mich.	N.Dak.	S.Dak.	Wis.	Corn Borer Lab.
Type hybrid Wis.355						2	
(B8 x MS211)x(MS114 x MS116)	MS54-27		1				
(B8 x MS116)x(W10 x MS206)	MS53-4523		1				
(B8 x MS211)x(W10 x MS206)	MS53-4524		1				
(MS116 x (MS211)x(W10 x MS206)	MS53-4544		1				
(W297 x A498)x(W182B x W79)	W1681					2	
(CM145 x MS1334)x(SD48 x A90)	CB5303			3			
Seeds requested		540	500	800	500	150	100

Seed shipped from Michigan 1, Wis. 2, N. Dak. 3

Participating stations:

A. M. Strommen	Wisconsin
D. B. Linden	Minnesota
D. B. Shank	South Dakota
Wm. Wiidakas	North Dakota
E. C. Rossman	Michigan

Wm. Wiidakas, Chairman

Table 10. Performance of all possible single crosses among nine inbred lines of 300 maturity series in four tests in 1956.

Pedigree	Yield bushels/Acre N.D. Fargo	Yield N.D. Cass	Yield Wis.	Yield Mich.	Yield Av. 4 tests	Moisture % N.D. Fargo	Moisture N.D. Cass	Moisture Wis.	Moisture Mich.	Moisture Av. 4 tests	Lodging % Root N.D.	Lodging Stalk N.D.	Lodging Stalk Mich.	Lodging Av.	Shelling % N.D.	Shelling Wis.	Shelling Av. 2 tests	Husking Qual.	Rating score plants N.D.	Rating Wis.
CM3 x ND203	85.9	56.9	82.3	49.3	68.6	16.3	10.8	17.7	37.4	20.6	2.2	2.5	1.3	2.0	83.6	81.5	82.6	m	1.8	2.3
" x A498	84.8	57.1	92.9	63.7	74.6	17.8	13.1	18.1	36.9	21.5	2.2	2.1	2.5	2.3	85.1	83.7	84.4	m	1.5	2
" x MS1334	83.0	53.0	86.6	69.1	72.9	22.3	14.2	22.7	41.0	25.1	0.5	0.5	0.0	0.3	81.3	80.6	81.0	mh	1.1	2
" x MS53	78.2	53.6	80.3	59.8	68.0	19.5	13.9	20.1	39.9	23.4	0.5	2.8	1.2	1.5	84.5	81.8	83.2	m	3.1	3
" x A90	80.4	54.0	85.1	58.8	69.6	18.0	12.7	18.1	40.9	22.4	0.0	1.5	0.0	0.5	79.8	78.5	79.2	me	2.3	2
" x CQ155	86.7	53.3	90.2	61.3	72.9	29.1	21.6	25.1	44.5	30.1	2.0	2.0	1.2	1.7	81.6	79.6	80.6	mh	1.2	3
" x B8	94.9	54.2	91.5	78.6	79.8	19.7	14.1	19.8	41.7	23.8	1.0	0.5	3.3	1.6	83.9	82.3	83.1	me	1.2	1.2
" x CQ153	86.7	36.5	87.6	65.4	69.1	23.5	26.2	20.6	45.2	28.9	0.5	1.0	0.0	0.5	84.6	83.6	84.1	mh	1.2	2
ND203 x A498	83.6	56.4	78.1	34.8	63.2	14.1	10.3	15.8	34.4	18.7	3.0	2.8	3.0	2.9	83.2	79.8	81.5	me	2.3	3
" x MS1334	76.9	56.2	87.4	64.8	71.3	15.5	10.1	17.5	39.3	20.6	3.2	3.8	1.3	2.8	78.8	79.3	79.1	me	2.3	3
" x MS53	74.3	55.9	79.0	69.7	69.7	14.2	10.4	17.7	45.6	22.0	3.8	3.4	0.0	2.4	79.4	78.4	78.9	m	3.1	3
" x A90	85.6	62.0	89.9	79.9	79.4	19.8	12.7	21.5	39.7	23.4	3.9	2.5	0.0	2.1	77.6	77.4	77.5	m	2.3	2
" x CQ155	90.7	66.1	86.4	76.6	80.0	22.6	13.8	21.7	42.2	25.1	3.2	1.8	0.0	1.7	80.7	78.0	79.4	me	1.5	3
" x B8	84.3	60.0	83.7	67.6	73.9	15.9	11.0	20.0	39.2	21.5	2.2	2.1	1.3	1.9	81.6	81.1	81.4	me	1.6	1.2
" x CQ153	90.3	48.0	85.3	70.7	73.6	21.4	20.5	20.2	42.5	26.2	5.3	1.5	0.0	2.3	83.7	81.4	82.6	me	1.2	2.3
A498 x MS1334	87.8	59.2	83.0	71.3	75.3	17.2	12.9	23.3	41.7	23.8	2.4	3.6	0.0	2.0	80.1	79.6	79.9	e	1.2	2
" x MS53	77.5	52.8	77.3	69.1	69.2	15.7	12.0	19.6	39.5	21.7	0.2	3.8	4.5	2.8	83.3	81.8	82.6	m	1.6	2.3
" x A90	85.3	46.7	-	76.5	74.5	17.7	16.2	-	40.3	23.1	0.0	3.2	2.2	1.8	80.7	-	80.7	m	2.1	-
" x CQ155	88.4	50.5	93.9	64.4	74.3	28.6	25.4	28.0	45.7	31.9	1.3	2.5	3.7	2.5	81.3	79.5	80.4	e	1	2.3
" x B8	92.3	53.8	97.3	73.4	79.2	14.4	12.7	20.3	41.4	22.2	1.0	2.1	2.5	1.9	85.2	83.5	84.4	me	1	1
" x CQ153	89.6	54.1	82.9	71.0	74.4	25.8	29.3	33.2	47.6	34.0	0.5	3.6	2.3	2.1	85.4	82.1	83.8	e	1	2
MS1334 x MS53	82.1	60.0	84.6	70.1	74.2	19.4	12.4	22.7	44.0	24.6	0.5	2.3	1.1	1.3	80.7	79.0	79.9	me	2.1	2
" x A90	84.2	63.1	92.2	63.7	75.8	21.7	11.7	21.9	41.2	24.1	0.0	1.5	0.0	0.5	77.0	76.8	76.9	h	1.4	1
" x CQ155	90.1	62.6	104.5	82.8	85.0	27.4	16.8	31.1	47.2	30.6	1.8	5.2	6.6	4.5	79.0	76.6	77.8	m	1	2
" x B8	76.5	59.4	96.1	59.2	72.8	19.1	11.3	23.4	43.0	24.2	0.5	2.0	1.6	1.4	82.0	79.5	80.8	m	1	1
" x CQ153	86.5	54.7	91.4	82.1	78.7	23.0	19.4	26.8	42.5	27.9	1.0	2.1	0.0	1.0	81.6	79.4	80.5	e	1	2
MS53 x A90	83.5	51.3	80.9	65.2	70.2	18.5	13.2	20.4	42.1	23.6	1.0	3.9	2.3	2.4	77.5	75.6	76.6	mh	2.3	2.3
" x CQ155	91.1	54.5	-	58.9	74.6	24.8	18.1	-	44.5	28.1	1.1	3.8	0.0	1.6	80.1	-	80.1	m	1.2	-
" x B8	81.9	51.5	81.0	85.6	75.0	19.0	13.8	20.9	40.1	23.5	1.2	2.8	1.1	1.7	82.0	80.8	81.4	m	1.6	2.3
" x CQ153	80.1	44.1	-	66.5	67.3	29.9	27.6	-	44.6	32.8	1.0	1.1	0.0	0.7	83.8	-	83.8	me	1.2	-
A90 x CQ155	85.9	43.8	89.8	69.7	72.3	27.8	20.6	29.0	46.2	30.9	1.0	3.6	0.0	1.5	79.6	75.8	77.7	mh	1.2	2.3
" x B8	88.4	48.7	91.8	72.1	75.3	19.6	13.4	21.2	43.4	24.4	0.5	3.5	3.5	2.5	80.9	79.2	80.1	m	1.0	1
" x CQ153	80.9	36.0	87.9	70.4	68.8	23.8	28.2	25.3	44.7	30.5	1.0	3.8	3.4	2.7	81.4	79.2	80.3	m	1.0	2.3
CQ155 x B8	90.7	48.8	94.3	77.1	77.7	25.0	19.9	25.9	43.4	28.6	1.0	3.0	3.7	2.6	81.3	79.2	80.3	me	1	2
" x CQ153	90.7	43.1	81.5	65.7	70.3	36.7	38.8	35.3	45.3	39.0	2.9	2.8	1.2	2.3	80.8	76.5	78.7	m	1	3
B8 x CQ153	84.2	38.9	77.3	74.5	68.7	26.3	30.4	31.4	47.3	33.9	1.0	2.4	8.4	3.9	83.1	80.1	81.6	m	1.0	2
L.S.D.	6.3	8.7	-	-	-	2.2														
Nodakhybrid 301	79.7	55.7	88.5	58.1	70.5	17.2	10.9	18.9	33.4	20.1	2.6	4.5	1.4	2.8	82.0	79.7	80.9	m	2.3	2
Wis. hybrid 355	83.6	51.5	-	-	-	24.3	19.0	-	-	-	1.2	1.5	-	-	82.8	-	-	mh	1.5	-

Table 11. Average performance of single crosses of 300 maturity tested in Michigan, Minnesota, North Dakota and Wisconsin in 1956.

Pedigree	1/ Acre yield	1/ Moisture at harvest	2/ Plants root lodged	3/ Plants stalk lodged	4/ Plant rating	4/ Shelling	2/ Smut	5/ Good ears per plant
	bu.	pct.	pct.	pct.		pct.	pct.	pct.
CM3 x ND203	67.2	19.9	2.7	4.9	2.1	82.6	3.4	80
x A498	73.6	21.7	2.2	5.3	1.8	84.4	2.9	85
x MS1334	71.9	25.3	0.3	3.9	1.1	81.0	0.7	76
x MS53	67.4	23.4	0.5	7.2	3.0	83.2	1.9	74
x A90	66.9	22.8	0	2.4	2.2	79.2	1.3	66
x CQ155	72.2	30.1	1.7	5.8	2.1	80.6	1.9	64
x B8	78.3	23.3	0.5	6.1	1.2	83.1	0.5	84
x CQ153	67.6	29.0	2.9	9.4	1.7	84.1	3.3	40
ND203 x A498	64.1	18.5	4.1	5.0	2.8	81.5	2.4	75
x MS1334	70.3	20.2	2.9	2.9	2.9	79.1	0.5	82
x MS53	68.8	21.5	1.9	4.4	3.1	78.9	0.7	69
x A90	76.6	23.3	2.2	3.2	2.2	77.5	1.4	74
x CQ155	79.1	24.5	5.0	2.8	2.8	79.4	1.0	52
x B8	73.1	21.1	1.1	2.0	1.4	81.4	0	84
x CQ153	72.4	26.1	8.8	6.2	2.0	82.6	1.0	75
A498 x MS1334	74.2	23.9	3.0	4.4	1.8	79.9	0.5	59
x MS53	69.5	22.0	0.1	8.5	2.0	82.6	1.2	70
x A90	70.8	24.0	1.3	3.6	1.9	80.7	1.9	45
x CQ155	73.2	32.3	6.1	5.8	2.1	80.4	1.9	49
x B8	77.8	22.2	0.5	5.0	1.0	84.4	0	62
x CQ153	72.3	34.5	6.3	4.0	1.8	83.8	0.5	44
MS1334 x MS53	71.7	24.7	0.3	5.6	2.1	79.9	0	47
x A90	74.4	23.7	0	1.2	1.2	76.9	0	81
x CQ155	82.7	31.1	3.4	10.1	1.6	77.8	0	35
x B8	71.0	24.4	0.3	3.2	1.0	80.8	0	54
x CQ153	74.9	28.5	8.8	10.4	1.6	80.5	1.0	38
MS53 x A90	69.3	23.3	0.7	7.0	2.3	76.6	1.7	69
x CQ155	73.0	28.6	0.6	16.6	1.6	80.1	0	36
x B8	72.5	23.8	1.1	10.1	2.0	81.4	0	40
x CQ153	66.1	33.0	0.5	9.5	1.6	83.8	0.5	33
A90 x CQ155	70.8	31.0	5.1	4.1	1.8	77.7	2.1	50
x B8	74.1	23.8	0.3	3.7	1.0	80.1	1.0	82
x CQ153	67.8	30.7	2.7	8.0	1.7	80.3	2.3	55
CQ155 x B8	77.7	28.4	2.1	6.1	1.6	80.3	0	66
x CQ153	69.9	38.8	15.6	7.4	1.7	78.7	2.1	31
B8 x CQ153	69.6	33.6	8.0	7.1	1.6	81.6	0.5	45

1/ Data from all locations
2/ Data from North Dakota and Minnesota
3/ Data from N. Dakota, Minn., & Mich.
4/ Data from Wisc. & N. Dak.
5/ Data from Minnesota only.

Table 12. Summary of the performance of the 9 inbred lines of the 300 maturity series in the 36 possible single crosses among them. (Prepared from data in table 11).

Parent line	CM3	ND203	A498	MS1334	MS53	A90	CQ155	B8	CQ153	Means (yield)
				Acre yield - Bushels						
CM3	-	67.2	73.6	71.9	67.4	66.9	72.2	78.3	67.6	70.6
ND203	19.9	--	64.1	70.3	68.8	76.6	79.1	73.1	72.4	71.5
A498	21.7	18.5	--	74.2	69.5	70.8	73.2	77.8	72.3	71.9
MS1334	25.3	20.2	23.9	--	71.7	74.4	82.7	71.0	74.9	73.9
MS53	23.4	21.5	22.0	24.7	--	69.3	73.0	72.5	66.1	69.8
A90	22.8	23.3	24.0	23.7	23.3	--	70.8	74.1	67.8	71.3
CQ155	30.1	24.5	32.3	31.1	28.6	31.0	--	77.7	69.9	74.8
B8	23.3	21.1	22.2	24.4	23.8	23.8	28.4	--	69.6	74.3
CQ153	29.0	26.1	34.5	28.5	33.0	30.7	38.8	33.6	--	70.1
				Moisture at harvest - percent						
Means	24.4	21.9	24.9	25.2	25.0	25.3	30.6	25.1	31.8	Means
				Root lodging - percent						(Root lodging)
CM3	--	2.7	2.2	0.3	0.5	.0	1.7	0.5	2.9	1.4
ND203	4.9	-	4.1	2.9	1.9	2.2	5.0	1.1	8.8	3.6
A498	5.3	5.0	-	3.0	0.1	1.3	6.1	0.5	6.3	3.0
MS1334	3.9	2.9	4.4	-	0.3	-	3.4	0.3	8.8	2.4
MS53	7.2	4.4	8.5	5.6	--	0.7	0.6	1.1	0.5	0.7
A90	2.4	3.2	3.6	1.2	7.0	-	5.1	0.3	2.7	1.5
CQ155	5.8	2.8	5.8	10.1	16.6	4.1	-	2.1	15.6	5.0
B8	6.1	2.0	5.0	3.2	10.1	3.7	6.1	-	8.0	1.7
CQ153	9.4	6.2	4.0	10.4	9.5	8.0	7.4	7.1	-	6.7
				Stalk lodging - percent						
Means	5.6	3.9	5.2	5.2	8.6	4.2	7.3	5.4	7.7	Means
				Plant rating						(Plant ratings)
CM3	-	2.1	1.8	1.1	3.0	2.2	2.1	1.2	1.7	1.9
ND203	82.6	--	2.8	2.9	3.1	2.2	2.8	1.4	2.0	2.4
A498	84.4	81.5	--	1.8	2.0	1.9	2.1	1.0	1.8	1.9
MS1334	81.0	79.1	79.9	-	2.1	1.2	1.6	1.0	1.6	1.7
MS53	83.2	78.9	82.6	79.9	--	2.3	1.6	2.0	1.6	2.2
A90	79.2	77.5	80.7	76.9	76.6	--	1.8	1.0	1.7	1.8
CQ155	80.6	79.4	80.4	77.8	80.1	77.7	--	1.6	1.7	1.9
B8	83.1	81.4	84.4	80.8	81.4	80.1	80.3	--	1.6	1.4
CQ153	84.1	82.6	83.8	80.5	83.8	80.3	78.7	81.6	--	1.7
				Shelling percents						
Means	82.3	80.4	82.2	79.5	80.8	78.6	79.4	81.6	81.9	

Table 13. Summary of the performance of all possible single crosses among 9 inbred lines in 300 maturity series, average of 4 tests, 1956.

		CM3	ND203	A498	MS1334	MS53	A90	CQ155	B8	CQ153	Yield means
					Acre yield, bushels						
CM3		--	68.6	74.6	72.9	68.0	69.6	72.9	79.8	69.1	71.9
ND203	Mois-	20.6	--	63.2	71.3	69.7	79.4	80.0	73.9	73.6	72.5
A498	ture	21.5	18.7	--	75.3	69.2	74.5	74.3	79.2	74.4	73.1
MS1334	at	25.1	20.6	23.8	--	74.2	75.8	85.0	72.8	78.7	75.8
MS53	har-	23.4	22.0	21.7	24.6	--	70.2	74.6	75.0	67.3	71.0
A90	vest	22.4	23.4	23.1	24.1	23.6	--	72.3	75.3	68.8	73.2
CQ155	per	30.1	25.1	31.9	30.6	28.1	30.9	--	77.7	70.3	75.9
B8	cent	23.8	21.5	22.2	24.2	23.5	24.4	28.6	--	68.7	75.3
CQ153		28.9	26.2	34.0	27.9	32.8	30.5	39.0	33.9	--	71.4
Moisture means		24.5	22.3	24.6	25.1	25.0	25.3	30.5	25.3	31.7	
					Loding percent						Lodging means
CM3		-	2.0	2.3	.3	1.5	.5	1.7	1.6	.5	1.3
ND203		82.6	--	2.9	2.8	2.4	2.1	1.7	1.9	2.3	2.3
A498	Shell-	84.4	81.5	--	2.0	2.8	1.8	2.5	1.9	2.1	2.3
MS1334	ing	81.0	79.1	79.9	-	1.3	.5	4.5	1.4	1.0	1.7
MS53	per	83.2	78.9	82.6	79.9	-	2.4	1.6	1.7	.7	1.8
A90	cent	79.2	77.5	80.7	76.9	76.6	-	1.5	2.5	2.7	1.8
CQ155		80.6	79.4	80.4	77.8	80.1	77.7	-	2.6	2.3	2.3
B8		83.1	81.4	84.4	80.8	81.4	80.1	80.3	-	3.9	2.2
CQ153		84.1	82.6	83.8	80.5	83.8	80.3	78.7	81.6	-	1.9
Shelling means		82.3	80.4	82.2	79.5	80.8	78.6	79.4	81.6	81.9	

Summary of prepotencies of 9 inbred lines used as parents in the single crosses of 300 maturity series.

Inbred line	Yield bu.	Moisture pct.	Lodging pct.	Shelling pct.
CQ153	71.4	31.7	1.9	81.9
CM3	71.9	24.5	1.3	82.3
ND203	72.5	22.3	2.3	80.4
A498	73.1	24.6	2.3	82.2
MD1334	75.8	25.1	1.7	79.5
MS53	71.0	25.0	1.8	80.8
A90	73.2	25.3	1.8	78.6
CQ153	75.9	30.5	2.3	79.4
B8	75.3	25.2	2.2	81.6

REPORT OF THE SUB-COMMITTEE ON UNIFORM TESTS OF 400, 500 and 600 MATURITIES

Seed of 3-way crosses involving 20 inbreds and 4 single cross testers was produced in 1956 by the Minnesota and Michigan stations for testing in 1957. The 4 single crosses were:

WF9 x M14	WR3 x W64A
WF9 x Oh51A	W32 x W64A

The 20 inbred lines were:

(1) A257 (A73 x Os420)
(2) A296 (A340 x Mo.940)
(3) A568 (Golden Jewel)
(4) A569 (A73 x Murdock)
(5) W136A
(6) W202
(7) W20R
(8) R165
(9) R168
(10) R172
(11) Iowa (Minn.Syn.1)24-3-1-2-1-2
(12) Iowa [(M14 x A206) x Oh4C)] 26-5-2-2-1
(13) B47 (A392 x R61)
(14) Iowa (Minn.Syn.2)6-2-2-1
(15) Oh26D (Composite of Oh26 recoveries)
(16) MS109 (W10 x Oh40B)
(17) MS111 (Oh40B x R53)
(18) MS121 (Pioneer 373)
(19) MS125 (L317 x MS50)
(20) MS126 (L317 x MS211)

The crosses with WF9 x M14 and WF9 x Oh51A will be tested in 1957 by: Ohio, Missouri, Iowa, Illinois, and Indiana. Michigan, Minnesota and Wisconsin plan to test the above lines with the four single crosses.

The following 20 inbreds have been nominated for seed production in 1957 and testing in 1958. Illinois plans 3-way seed production using WF9 x M14 as the tester. Ohio plans to produce crossed seed using a double-cross pollinator (Oh51A x Oh26D) x (Oh26A x Oh26F). Michigan plans 3-way seed production with an earlier single cross (to be announced later).

Nominated inbreds:	Maturity
(1) Iowa (Minn.Syn.1)-11-1-1-1-1-1-2	600
(2) Iowa (Minn.Syn.2) -9-2-1-1-1-1	600
(3) Iowa (P-33-2-2)Pioneer multiple cross [(SRS92 x G3)-8-4 x (A344 x L317)-46-E-1-A-A]	600
(4) Oh45S (M14 x 187-2) Oh45 x Oh45	600
(5) Oh26F (Composite Oh26 recoveries)	500
(6) W375 R4 (Rec. A375 Longeared O.P.)	400
(7) W220 (O.P. Wis. No.25)	400
(8) W212 (O.P. Western Plowman x W52)	500
(9) MS127 [(Oh40B x Hy) x MS24A]	500
(10) MS128 (Ohio M15)	500

Nominated inbreds (cont'd):	Maturity
(11) MS129 (Hy2 x MS113)	500
(12) MS116 (Duncan O.P.)	400
(13) MS68 (MAC O.P.)	400
(14)–(18) 5 lines from Illinois. Designations not available at meeting -- will be sent to Chairman.	
(19)–(20) 2 lines from Minnesota. Designations not available at meeting--will be sent to Chairman.	

The tests of AES hybrids and candidates of 500-600 maturities will be continued in 1957 with a total of 18 hybrids. AES512 will be dropped from these tests as seed of this hybrid no longer is being produced.

New nominations:	Maturity
(1) Ill. 1864 (M14 x WF9) x (Oh43 x W22)	600
(2) Ill. 1960 (M14 x W64A) x (B14 x A545)	600
(3) Ill. 3016 (WF9 x M14) x (B37 x Oh43)	600
(4) Mich. 54-116 (WF9 x MS120) x (Oh43 x MS211)	600
(5) Mich. 54-70 (WF9 x MS107) x (Oh43 x MS208)	600
(6) Ind. 6225 (W64A x M14) x (B14 x A297)	600

Retest nominations:	
(7) Ill. 1863 (M14 x WF9) x (I205 x Oh43)	600
(8) Ia.4757 (WF9 x M14) x (B16 x Oh51A)	600
(9) Ia.4779 (WF9 x M14) x (Oh43 x Oh51A)	600
(10) Mich. 52-25 (WF9 x M14) x (Oh51A x MS212)	600
(11) Mich.53-151 (WF9 x MS209) x (MS106 x MS107)	500
(12) Ind. 5409 (WF9 x W22) x (M14 x B14)	600
(13) CB4603 (A295 x W64A) x (B14 x A297) Minnesota	500-600
(14) CB4621 (A295 x W64A) x (B14 x A239) Minnesota	500-600
(15) AES610 (WF9 x W22) x (H19 x B9)	500
(16) AES610 (M14 x A73) x (Oh43 x Oh51A)	600
(17) Ohio M15 (Oh51 x Oh26) x (A x W23)	500 type hybrid
(18) Ohio K24 (Oh51A x WF9) x (Oh33 x Oh40B)	600 " "

The 9 stations desiring to test this group of hybrids and the numbers of seeds desired by each station are listed below:

Nebraska	250 seeds	Minnesota	540 seeds
Indiana	320 "	Ohio	200 "
Iowa	220 "	Wisconsin	250 "
Illinois	250 "	So.Dakota	320 "
Michigan	300 "		

Duane Linden
N. P. Neal
G. H. Stringfield
E. C. Rossman, Chairman

The Sub-Committee report was presented by E. C. Rossman who MOVED that it be accepted.

Seconded by O. E. Nelson and passed.

REPORT OF THE SUB-COMMITTEE ON UNIFORM TESTS OF 700 and 800 MATURITIES

The Sub-Committee sponsored tests of 3-way crosses of 800 maturity in 1956 involving 20 inbred lines and the tester single crosses WF9 x Hy and WF9 x 38-11. The data from these tests are summarized in Table 14. (pages 48 and 49).

Seed of a new set of 3-way crosses involving the same two tester single crosses was produced in 1956 for testing in 1957. Seed of the crosses with WF9 x 38-11 was produced by G. F. Sprague and that of the crosses with WF9 x Hy by J. H. Lonnquist. Seed of the following combinations is available for testing in 1957.

Line	Origin	Tester parent: WF9 x Hy	Tester parent: WF9 x 38-11
L317		x	-
38-11		x	-
Hy		-	x
B44	SSS456	x	x
CI.31A		x	x
K799	Butler Co. Yellow Dent	x	x
K800	Queen of Beauty	x	x
Mo.11662	(L304 x B1)	x	x
Mo.11276	(A73 x B18)	x	x
Oh3C	(K55 x Reid 4-1)	x	-
Oh3F	(K55 x Reid 4-1)	x	x
Oh4G	(M14 x A206) x Oh4C	x	x
Oh7K	(Oh41 x 38-11) x Oh7A	x	-
Oh7N	(Oh41 x Oh7A)	x	x
Oh7P	(38-11 x Oh7A)	x	-
R113	SSS296	x	-
R153		x	x
R154		x	x
R159		x	x
R166		x	x
R168		x	x

The following stations have requested seed of these 3-way crosses for testing in 1957:

Illinois	(250K)	Kansas	(300K)	Nebraska	(200K)
Indiana	(300K)	Kentucky	(200K)	Ohio	(200K)
Iowa	(200K)	Missouri	(200K)	Oklahoma	(300K)

Three-way crosses of 700 maturity will be produced in 1957 for testing in 1958. Ten inbred lines have been nominated and will be crossed on the tester single crosses WF9 x M14 and Oh28 x Oh43. The lines nominated and the plans for seed production are shown below:

Line		Origin		To be crossed on: (Nebraska) (WF9 x B14)	(Illinois) (Oh28 x Oh43)
1.	B42	Corn Borer Syn. #1		x	x
2.	B43	SSS		x	x
3.	B46	(W22 x B10)-1-4-4		x	x
4.	H49	Blight Res. WF9		-	x
5.	Oh7K	(Oh41 x 38-11) x Oh7A		x	x
6.	R103	Snelling Corn Borer syn.		x	x
7.	R165	Germplasm 380	54	x	x
8.	R174	" 150	58	x	x
9.	R184	I.159 x Oh45 (2B)		x	-
10.	R185	R76 x 5120B (3)		x	x

Twenty-five seeds of each nominated line is to be sent to R. W. Jugenheimer and to J. H. Lonnquist.

Three-way crosses of 800 maturity involving 17 inbred lines and the two testers WF9 x Hy and WF9 x 38-11 will be produced in 1957 for testing in 1958. The lines nominated and the arrangements for seed production are summarized below:

Line		Origin	To be crossed on: (Nebraska) (WF9 x Hy)	(Iowa) (WF9 x 38-11)
1.	L317		x	x
2.	38-11		x	-
3.	Hy2		-	x
4.	H55	Blight Res. (Hy x Mo.21A)	-	x
5.	H52	Blight Res. (38-11 x L97)	x	-
6.	B45	(W22 x B10)-1-1	x	x
7.	K805	(K55 x 38-11)-2B-6S	x	-
8.	K806	Golden Republic O.P.	x	x
9.	Ky36-11	Jewetts #6 D. C.	x	x
10.	Mo.11225	Pioneer x 5956	x	x
11.	Oh45S	(M14 x 187-2) x $Oh45^2$	x	x
12.	Oh7N	(Oh41 x Oh7A)	x	x
13.	R92	Hy x $WF9^2L$ $(W)S_7$	x	x

Line		Origin		to be crossed on: (Nebraska) (WF9 x Hy)	Iowa (WF9 x 38-11)
14.	R177	Germ plasm 230B	57	x	x
15.	R186	B2 x N6 (2)	54	x	x
16.	R187	R76 x Oh45 (1A)	54	x	x
17.	R188	Kys x N6 (1A)	54	x	x

Twenty-five seeds of each nominated line are to be sent to G. F. Sprague and J. H. Lonnquist.

AES Hybrids and Candidates of 700 Maturity for Testing in 1957

Standard Hybrids

1. Ia.4297 (WF9 x I205) x (M14 x 187-2)
2. AES702 (WF9 x Hy2) x (M14 x C103)

Nominations (candidates)

1. Ia.4809 (WF9 x M14)x(B14 x B37)
2. Ia.4879 (WF9 x Oh43)x(B14 x B37)
3. Ia.4880 (WF9 x Oh43)x(B14 x B38)
4. Ill.1575 (WF9 x M14)x(L12 x Oh28)
5. Ill.3011 (WF9 x B14)x(C103 x Oh43)
6. Ill.3124 (WF9 x Hy2)x(R71 x R168)
7. Ill.1555A(WF9 x Oh51A)(I224 x Oh28)
8. Ill.1936 (WF9 x Hy2)x(M14 x B14)
9. Nebr.1924 (WF9 x Hy2)x(N6 x B14)
10. CB4726A (WF9 x B14)x(Oh28 x Oh43)

The AES hybrids and candidates of 700 maturity will be tested at the following 8 stations.

Iowa	(220K)	Michigan	(200K)
Indiana	(320K)	Missouri	(200K)
Illinois	(250K)	Ohio	(200K)
Kansas	(300K)	Nebraska	(200K)

AES Hybrids and Candidates of 800 Maturity for Testing in 1957

Standards

1. U. S. 13* (WF9 x 38-11) x (Hy x L317)
2. AES808* (WF9 x 38-11) x (Oh43 x H14)

Nominations

3. Ia.4906 (WF9 x B7) x (B14 x B39)
4. Ia.4907 (WF9 x B7) x (B10 x B14)
5. Ia.4912* (WF9 x B14) x (Hy x Oh41)
6. Ind. 4655* (WF9 x P8) x (Oh43 x C103)
7. Ind. 4656* (WF9 x P8) x (Oh43 x H14)
8. Ind. 5655* (WF9 x H50) x (Oh45 x Oh7B)
9. Ind. 6623 (WF9 x H52) x (H53 x C103)
10. Ind. 6833 (WF9 x H52) x (H54 x H60)
11. Ill. 1893 (C103 x 38-11) x (Oh7B x Oh29)
12. Ill. 1939 (R71 x R98) x (R105 x R153)
13. Ill. 1981 (WF9 x 38-11) x (Oh7 x CI.21E)
14. Ill. 1992 (WF9 x Oh7A) x (C103 x B14)
15. Ill. 1996 (C103 x B14) x (Hy2 x Oh7)
16. K1884 (N6 x Oh28) x (Hy x R59)
17. Mo.4060A(W)* (Mo.1W x N72) x (K41 x H30)

* Retests

The AES hybrids and candidates of 800 maturity will be tested at the following 9 stations:

Iowa	(220K)	Kansas	(300K)	Kentucky (200K or 400K if possible)
Indiana	(320K)	Missouri	(200K)	Oklahoma (200K)
Illinois	(250K)	Ohio	(200K)	Nebraska (200K)

R. W. Jugenheimer
G. F. Sprague
J. H. Lonnquist, Chairman

Table 14. Summary of performance of uniform 800 maturity three-way crosses, 1956.

Hybrid	Acre grain yield 1/	Moisture at harvest 2/	Days to 1/2 silk 3/	Lodging root 1/	Lodging stalk 1/	Dropped ears 4/	Ear ht. 4/	Blight H. turcicum 5/	Blight H. maydis 5/	Corn Borer Infested plants 6/	Corn Borer Leaf feeding 7/
	bu.	pct.	no.	pct.	pct.	pct.	score	rate	rate	pct.	pct.
(WF9 x Hy) x 38-11	76.0	14.8	68	2.0	7.1	6.0	3.4	3.5	3.5	5.6	4.4
" x K706	80.4	15.3	64	0.2	5.3	2.3	3.2	4.0	3.5	18.7	4.8
" x K756	85.6	15.7	64	0.8	12.3	0.7	3.4	4.0	3.0	22.4	5.4
" x K757	89.4	15.3	65	1.0	6.4	0.9	3.3	4.5	4.0	32.8	4.4
" x K758	87.6	16.7	65	0.0	24.0	2.1	3.0	3.5	3.5	19.1	4.4
" x K759	89.1	16.3	67	0.8	12.6	2.7	3.7	3.0	3.0	18.3	3.8
" x Mo.11090	85.2	16.8	66	0.3	5.5	1.1	3.1	2.0	3.0	41.7	5.2
" x Mo.11072	84.3	16.6	65	0.0	10.8	1.3	3.3	2.0	2.0	54.3	5.6
" x CI.30	83.2	17.0	67	0.4	11.0	2.7	3.4	1.5	1.5	43.0	5.2
" x CI.32	97.3	17.1	68	0.3	16.9	4.1	4.2	1.5	3.0	18.5	4.2
" x B39	89.8	15.6	67	0.0	15.2	1.0	3.3	5.0	3.0	27.7	3.9
" x B40	92.5	16.3	65	0.3	15.2	0.2	3.7	4.5	4.0	50.5	5.2
" x L317	93.5	16.9	67	0.2	12.2	3.3	4.0	2.5	3.5	29.6	3.0
" x Tr.-13634-17	82.8	16.6	65	0.3	12.2	2.5	3.4	1.0	2.0	31.9	5.0
" x Tr.-13633-8	86.7	16.3	67	0.6	8.3	2.6	3.4	3.0	2.0	25.7	3.9
" x 187-2-13657-6	87.5	16.9	67	0.5	13.0	0.7	3.7	1.0	2.5	15.4	4.3
" x Mo.940-13662	91.4	17.7	70	2.2	23.2	3.3	3.7	3.0	2.5	29.7	4.6
" x Syn.I-13798	86.6	15.2	67	0.5	6.2	1.9	3.3	1.5	3.0	26.8	4.8
" x 38-11-13755-13	98.8	15.6	67	0.2	11.5	2.6	3.8	1.0	2.0	36.8	5.1
" x CI.38B	88.7	15.9	67	0.0	11.0	2.9	3.6	1.0	2.5	29.6	4.1
(WF9 x 38-11) x K756	85.8	14.3	64	0.2	16.0	1.4	3.1	3.0	3.0	25.7	5.4
" x K757	89.7	14.5	64	0.4	9.3	0.9	3.4	4.5	3.5	26.1	4.8
" x K758	91.2	15.4	66	0.0	14.3	2.9	3.1	3.0	3.5	26.1	4.6
" x K759	95.5	16.3	67	0.0	9.5	1.0	3.8	3.0	2.5	28.4	3.8
" x Mo.11090	82.1	17.7	67	0.5	6.6	2.1	3.3	2.5	2.0	35.2	5.1

Table 14 (cont'd.)

Hybrid		Acre grain yield 1/	Moisture at harvest 2/	Days to ½ silk 3/	Lodging root 1/	Lodging stalk 1/	Dropped ears 4/	Ear ht. 4/	Blight H. turcicum 5/	Blight H maydis 5/	Corn Borer Infested plants 6/	Corn Borer Leaf feeding 7/
		bu.	pct.	no.	pct.	pct.	pct.	score	rate	rate	pct.	pct.
(WF9 x 38-11)	x Mo.11072	78.8	17.0	65	0.2	6.4	1.1	3.3	2.0	1.0	42.2	5.8
"	x CI.30	76.6	15.4	68	0.2	3.9	2.9	3.4			53.1	5.4
"	x CI.32	97.8	17.3	69	0.8	16.3	6.7	4.2	1.5	1.5	28.9	5.0
"	x CI.42A	93.2	16.4	68	0.4	12.9	2.3	4.0	1.0	1.5	37.3	5.2
"	x B39	89.7	15.2	67	0.0	23.4	1.6	3.4	4.5	2.0	27.4	5.3
"	x B40	84.4	16.0	67	0.0	9.2	0.6	3.7	3.5	1.5	36.9	5.5
"	x L317	89.4	16.4	68	0.0	13.0	8.1	4.1			27.4	3.9
"	x Tr-13634-17	87.8	15.8	65	0.3	11.2	4.7	3.3	1.5	0.5	31.2	5.2
"	x Tr-13633-8	85.1	16.3	67	0.3	12.2	3.1	3.4	2.5	2.0	36.5	4.6
"	x 187-2-13657-6	81.8	15.2	66	0.0	9.9	2.4	3.7	1.0	2.5	34.6	4.8
"	x Mo.940-13662	93.8	16.6	70	1.1	21.4	4.9	3.9	2.0	2.0	33.1	4.8
"	x Syn.I-13798	86.2	15.1	68	0.3	2.7	1.2	3.5	1.5	2.5	35.6	4.8
(WF9 x 38-11)	x Hy	91.8	15.7	67	0.6	11.8	3.3	4.0			12.8	4.4
U.S. 13		88.7	16.1	68	1.4	12.7	6.2	4.1	3.0	2.0	18.0	4.8

1/ Ky., Ia., Ind., Mo., Kan., & Ohio
2/ Ky., Ia., Ind., Mo., Kan., & Ohio
3/ Ind., Kan., and Ohio
4/ Ky., Ia., Ind., Mo., & Kan.
5/ Beltsville
6/ Ohio
7/ Kentucky

The report of the Sub-Committee was presented by G. H. Lonnquist who MOVED that it be accepted.

Seconded by M. S. Zuber and passed.

REPORT OF THE SUB-COMMITTEE ON UNIFORM TESTS OF 900 MATURITY

Uniform yellow and white topcross tests involving the tester parents Mo.804 and AES903W, respectively, were grown in 1956. Results of these tests are reported in tables 15 and 16. (pages 54 and 55).

Crosses with Mo.804 were grown in Illinois, Kansas, Kentucky, Missouri and Virginia, and at Beltsville, Maryland, for leaf blight evaluation and Ankeny, Iowa, for corn borer ratings. The following lines were included in the tests:

K711	K765	Mo.9635
K713	K766	Mo.9662
K720	K767	Mo.9689
K758	K770	N15
K759	K771	Oh7B
K762	Ky126	Ok11
K763	Mo.0225	CI.34
K764	Mo.9108	CI.35

AES903W uniform topcross tests were grown in 1956 in Illinois, Kansas, Kentucky, Missouri, Ohio, and Virginia and at Beltsville, Maryland, and Ankeny, Iowa. Lines included in this test were:

Kan.647-53	Kan.503-52	Kan.722-53
Kan.691-53	Kan.689-53	Kan.242-51
Kan.859-52	Kan.690-53	Kan.519-52
Kan.661-53	Kan.364-50	Kan.788-53
Kan.669-53	Kan.709-53	Mo.12021

Seed of yellow topcrosses with Mo.804 for 1957 tests was produced by the Missouri Agricultural Experiment Station. The following crosses are available for testing.

Mo.804 x R113	Mo.804 x Mo.01392
" x R153	" x Mo.01480
" x R154	" x Mo.1979
" x R159	" x Mo.11077
" x R166	" x Mo.11144
" x R173	" x Mo.11153
" x Kan.3-133	" x Mo.11276
" x Kan.3-159	" x NC218
" x Kan.5-49	" x NC220
" x Kan.5-54	" x NC222
" x Kan.5-76	" x NC224
" x Kan.5-86	" x Oh8
" x Mo.9108	" x CI.90A
" x Mo.9294	" x CI.91B

States interested in testing the yellow topcrosses and the number of seeds requested by each are as follows:

Kansas	400 seeds	Oklahoma	300 seeds
Kentucky	400 "	Virginia	400 "
Missouri	400 "	Iowa (corn borer)	75
Ohio	200 "		

Seed of AES903W topcrosses for 1957 tests was made by the Kansas Agricultural Experiment Station. The following crosses are available for testing:

AES903W x 33-16	AES903W x K5-540
" x K699	" x K5-591
" x K723	" x K5-596
" x K733	" x K5-668
" x K735	" x K5-673
" x K745	" x K5-754
" x K3-580	" x Ky201
" x K3-785	" x Mo.11474W
" x K5-463	" x Mo.11903W
" x K5-468	" x Mo.12001W
" x K5-470	" x Mo.12041W
" x K5-474	" x Mo.2782W
" x K5-509	" x Oh3W
" x K5-514	" x CI.49A
" x K5-515	" x Eg205
" x K5-516	

The following States requested seed in the amounts indicated.

Kansas	400 seeds	Virginia	400 seeds
Kentucky	400 "	Iowa (corn borer)	75 seeds
Missouri	400 "		

Three-way combinations involving B41 x Oh7A as tester parent for the yellow lines and K55 x CI.64 for the white lines will be made in 1957 for 1958 uniform tests. Missouri and Oklahoma will make seed of the yellow crosses and Kansas and Kentucky seed of the white three-way combinations. Cooperators entering lines in the respective tests should supply seed as follows:

Yellow lines	White lines
Missouri -- 50 seeds	Kentucky -- 50 seeds
Oklahoma -- 30 seeds	Kansas -- 30 seeds

Lines nominated for three-way crosses are listed below under their corresponding tester parent:

B41 x Oh7A

Line	Origin
38-11	
Oh41	
CI.21E	
CI.38B	
CI.21E x CI.42A	
K708	K1583
K720	Synthetic
K5-50	O.P.Hendrick Midland
K763	SWCB Mass Sel.
K6-49	Allen Co. Yellow O.P.
Ky56-368	(P8 x T202[1/]) S7
Ky56-433	(M14 x CI.7) S8
Ky55-537	M14 x Ky44-39 S7
Ky55-549	M14 x Ky45-60 S7
Ky55-557	M14 x Ky45-66 S7
Ky55-562	M14 x Ky44-59 S7
Ky55-572	M14 x Ky44-39-3 S7
Mo. Syn	Lehman's O.P.
Mo.1853	K4 x L317
Mo.11432	H7 x L317[2/]
Mo.2788B	T13 x CI.21E
Mo.3952	K64 x K4
Mo.3957	T13 x K4
Mo.53686	P8 x T202
Mo.9681	90 O.P.

K55 x CI.64

Line	Origin
33-16	
H30	
Ky27	
Ky49	
CI.49B	
K730	Pride of Saline
K755	WF9[2/] x K63
K784	Mo.21A x WhWF9
K5-453	H21 x K44
K5-474	H30 x Mo.22
K5-509	K41 x Mo.22
K5-512	K41 x Mo.22
K5-515	K41 x Mo.22
K5-516	K41 x Mo.22
K5-557	Crawford Co.Chief O.P.
K5-525	Pride of Saline
Ky201	White Pearl
Ky209	Ky30A x 38-11
Ky211	WF9 x Ky39
Ky213	(Ky30A x 38-11) 38-11[2/]
Ky56-126	WW10 O.P.
Ky56-150	WS19 O.P.
Ky56-180	H21 x M14 Sel.
Ky55-190	H13 x M14 Sel.
Mo.HP105	O.P. Pipe Corn

The 1956 tests of the 900 maturity series AES hybrids and candidates was grown in Illinois, Kansas, Kentucky, Missouri and Ohio and at Beltsville, Maryland for leaf blight evaluation. Results were summarized and distributed to members of the North Central Corn Breeding Research Committee. Candidates, all entered for the first time in 1956 were: Ill. 1851, Ill. 1889, Ill. 1893, Ill. 1919, and Mo. 916.

The following hybrids were nominated for 1957 tests:

Ill. 1849 (C103 x 38-11)(K201 x CI.21E)	
Ill. 1851 (C103 x 38-11)(Oh7 x CI.21E)	(Retest)
Ill. 1893 (C103 x 38-11)(Oh7B x Oh29)	(Retest)
Ill.2246W (R144 x R145)(R148 x R149)	
Ind.6615 (H49 x H55)(H53 x B14)	
Ind. 6874 (H49 x H52)(H59 x H60)	
K2472W (K55 x K697)(K41 x H30)	
Mo.800-3 (K201r x T202)(Mo.9284 x CI.21E)	
Mo.916 (Mo.9108 x CI.21E)(Oh7B x Oh29)	(Retest)
Mo.958 (B41 x Oh7A)(Mo.3 x CI.21E)	
U.S.619W (CI.64 x K55)(Ky27 x Ky49)	

Standards

Mo.804 (CI.7 x K4)(38-11 x CI.21E)	(Type hybrid)
AES903W (K55 x H28)(K41 x H30)	
AES904W (K64 x Mo.22)(T111 x T115)	
US523W (K55 x K64)(Ky27 x Ky49)	

States interested in testing this series of hybrids, and the amount of seed requested by each, are as follows:

Illinois - Urbana - 250 seeds	Ohio - 200 seeds
Illinois - Southern - 120 "	Oklahoma - 200 seeds
Indiana - 320 seeds	Virginia - 400 seeds
Kansas - 400 seeds	Iowa (corn borer) 75 seeds
Kentucky - 400 seeds	
Missouri - 400 seeds	

M. S. Zuber
Wm. R. Findley, Chairman

Table 15. Average performance of the 900 maturity topcrosses with Mo.804 compared in Illinois, Kansas, Kentucky, Maryland, Missouri, and Virginia in 1956.

	1/	1/	2/	2/	3/	4/	5/	6/		7/	7/
Pedigree	Acre yield	Moisture	Lodging root	Lodging stalk	Days to 1/2 silk	Dropped ears	Ear ht.	Blight H. turcicum	Blight H. maydis	Smutted plants	Shelling
	bu.	pct.	pct.	pct.	no.	pct.	grade	score	score	pct.	pct.
Mo.804 x K711	66.8	16.4	0	23	73	0.8	3.5	3.0	2.5	0	80
" x K713	65.9	16.7	1	23	76	1.4	3.8	3.0	2.0	4	81
" x K720	72.7	14.5	2	17	68	1.4	3.5	2.5	1.5	4	81
" x K758	70.4	15.9	1	27	70	1.4	3.3	3.0	3.0	1	80
" x K759	66.5	16.6	0	26	72	3.7	3.8	2.5	3.0	0	79
" x K762	62.4	16.3	1	22	75	1.4	3.7	3.0	1.0	1	81
" x K763	65.5	15.7	1	20	--	0.6	3.7	2.5	2.5	2	79
" x K764	60.6	16.1	1	19	70	1.7	3.3	1.5	3.5	0	81
" x K765	71.4	17.3	1	26	73	1.9	3.9	2.5	3.0	0	77
" x K766	67.8	16.7	0	25	74	1.9	3.6	2.5	3.0	1	79
" x K767	65.0	16.4	1	23	76	1.1	3.4	1.5	1.5	5	78
" x K770	65.2	16.7	0	8	70	2.7	3.3	2.5	2.5	1	79
" x K771	63.2*	16.1*	2*	27*	74	0.6	3.8	1.5	2.5	0	77
" x Ky126	62.8	15.4	1	7	76	1.5	3.9	3.5	3.0	2	79
" x Mo.0225	66.7	18.4	1	12	75	0.0	3.8	3.0	2.5	1	79
" x Mo.9108	63.2*	14.7*	1*	24*	--	2.3	4.1	3.0	1.5	5	77
" x Mo.9635	68.2	15.2	2	29	--	0.3	3.9	3.0	2.5	0	79
" x Mo.9662	60.8	16.5	1	32	75	0.9	3.8	2.5	3.0	0	81
" x Mo.9689	70.6	15.3	1	14	75	0.3	3.8	3.0	3.5	2	82
" x N15	66.1	17.6	1	39	72	2.0	3.5	2.5	3.5	1	81
" x Oh7B	63.9	15.0	0	13	74	0.6	3.6	3.5	3.0	1	81
" x Ok11	67.4	15.9	0	20	72	0.3	3.3	1.5	1.5	3	81
" x CI.34	69.3	15.1	1	20	71	1.4	3.8	1.5	2.5	1	80
" x CI.35	69.1	17.8	2	23	74	2.5	3.8	2.5	2.5	0	78
" (CI.7 x K4) x (38-11 x CI.21E)	67.3	15.9	1	23	74	3.3	3.8	2.5	2.0	2	79
Mean	66.6**	16.2**	1**	21**	73	1.4	3.7	2.5	2.5	1	80

* Entries were not included in the Virginia test

** Does not include entries that were not in the Virginia test

1/ Ill., Kan., Ky., Mo., Va.
2/ Kans., Ky., Mo., Va.
3/ Kansas
4/ Ill., Kan., Mo.
5/ Ill., Kan., Ky.
6/ Maryland
7/ Illinois

Table 16. Average performance of 900 maturity topcrosses with AES903W grown in Illinois, Kansas, Kentucky, Maryland, Missouri, Ohio, and Virginia in 1956.

Pedigree	Acre yield 1/	Moisture 1/	Lodging root 2/	Lodging stalk 3/	Days to 1/2 silk 4/	Dropped ears 5/	Ear ht. 6/	Blight H. turcicum 7/	Blight H. maydis 7/	Corn borer inf.pl. 8/	Smutted plants 9/	Shelling 9/
	bu.	pct.	pct.	pct.	no.	pct.	grade	score	score	pct.	pct.	pct.
AES903W x Kan.647-53	78.4	17.9	2	9	66	7.8	3.6	2.0	2.5	32.7	0	77
" x Kan.691-53	78.1	20.0	1	17	70	7.9	4.0	2.5	3.5	21.8	2	76
" x Kan.859-52	76.1	17.8	0	14	70	3.7	3.6	3.0	3.0	19.0	0	78
" x Kan.661-53	68.9	21.7	2	4	72	3.5	3.5	2.0	2.0	24.7	3	73
" x Kan.669-53	75.3	19.8	0	6	67	1.6	3.4	3.0	2.5	31.3	3	74
" x Kan.503-52	73.4	17.8	0	9	70	8.0	4.1	3.5	3.0	29.7	2	78
" x Kan.689-53	89.8	18.1	0	12	68	6.0	3.8	2.5	3.0	30.3	5	78
" x Kan.690-53	83.3	19.1	0	10	70	4.5	3.9	3.0	3.0	33.3	1	75
" x Kan.364-50	71.3	20.6	1	11	72	2.9	4.1	3.5	3.5	21.1	3	80
" x Kan.709-53	83.2	20.9	2	8	71	8.0	4.0	1.5	2.5	37.0	1	77
" x Kan.722-53	76.7	18.8	1	14	71	7.0	3.8	3.5	1.0	23.9	4	79
" x Kan.242-51	83.5	19.6	6	10	70	9.1	3.7	1.5	3.5	31.0	3	82
" x Kan.519-52	79.4	18.9	0	10	67	2.0	3.1	3.5	3.0	18.5	1	79
" x Kan.788-53	78.9	17.3	2	7	68	3.6	3.7	4.0	2.5	22.3	0	75
" x Mo.12021	72.2	19.6	0	11	69	6.6	3.7	3.0	3.0	20.3	3	81
AES903W(K41 x H30 x (K55 x H28)	80.4	18.9	1	14	68	4.8	3.5	3.0	3.5	22.2	1	77
Mean	78.1	19.2	1	10	69	5.4	3.7	2.8	2.8	26.2	2	77

1/ Ill., Kan., Ky., Mo., Ohio, Va.
2/ Kan., Ky., Mo., Va.
3/ Kan., Ky., Mo., Ohio, Va.
4/ Kan., Ohio
5/ Ill., Kan., Mo.
6/ Ill., Kan., Ky.
7/ Maryland
8/ Ohio
9/ Illinois

The Chairman called on N. P. Neal for a follow-up on yesterday's discussion on enlisting members of the hybrid seed corn industry in a cooperative undertaking to develop a uniform system of classifying hybrids for maturity.

N. P. Neal presented the following motion.

Whereas much confusion prevails in respect to maturity classifications of hybrid corn, the breeders of the North Central Corn Breeding Research Committee affirm:

(1) The conviction that the establishment of a uniform system of maturity designations would be of material benefit alike to farmers and to the hybrid seed corn industry.

(2) That it is feasible to develop such a system based essentially on the existing 100 to 900 maturity series of the North Central Region.

It is MOVED that the Sub-Committee on Maturity Ratings be urged to develop a uniform system of maturity ratings for hybrid corn in cooperation with the seed corn industry.

Seconded by J. H. Lonnquist and passed.

REPORT OF THE NOMINATING COMMITTEE

R. W. Jugenheimer, Chairman of the Nominating Committee reported that the committee nominated A. M. Strommen and A. J. Ullstrup for two-year terms to succeed E. C. Rossman and D. B. Shank.

G. F. Sprague MOVED that the nominations be closed and the Secretary cast a unanimous ballot for the nominees.

Seconded by M. S. Zuber and passed.

N. P. Neal MOVED that M. T. Jenkins be elected for another year as Secretary.

Seconded by G. F. Sprague and passed

CHANGE OF COMMITTEE NAME

Director Volk stated that according to present terminology in the naming of regional committees a "Technical" committee receives regional

funds whereas a "Research" committee does not. Since the corn committee does not receive regional funds it classes as a "Research" committee rather than a "Technical" committee.

G. F. Sprague MOVED that the name of the committee be changed to North Central Corn Breeding Research Committee, NCR-2.

Seconded by O. E. Nelson and passed.

1958 MEETING

M. S. Zuber MOVED that the 1958 meeting be held on March 4 and 5, 1958, at the Illini Center or some other suitable place to be arranged by the Executive Committee

Seconded by R. W. Jugenheimer and passed.

N. P. Neal MOVED that the Committee indicate its appreciation for the use of the Illini Center by a letter to Dr. D. D. Henry, President of Illinois University.

Seconded and passed.

The remainder of the morning session was devoted to reports by H. H. Kramer, M. S. Zuber and Edw. H. Coe., Jr., on high amylose corn. Summaries of these reports follow:

THE INTERACTION OF GENES WHICH AFFECT THE AMYLOSE-AMYLOPECTIN RATIO

Herbert H. Kramer and Roy L. Whistler

Since 1947 studies at Purdue have been directed toward the snythesis of combinations of endosperm genes in corn. Particular attention was paid to amylose percentage.

Because of difficulties in recognizing and isolating genotypes, either by phenotypic classification or by breeding tests, properties of the endosperm starch were sought which might aid in this determination. The temperature at which starch grains lose birefringence under polarizied light has been found to be particularly helpful. The fact that only a few starch grains are required for the test adds to its utility since a few starch grains may be taken from the endosperm and the same seed planted and grown to maturity.

Many of the combinations involving the five genes, *du* on chromosome 10, *ha* on 5, *su* on 4, su_2 on 6 and *wx* on 9, have now been synthesized. Data on the singly, doubly, and some triply recessive combinations are given in the following table:

Amylose and birefringence values on corn endosperm genotypes

Culture	Gene combination	Percent amylose	Birefringence end point, °C	Phenotype
56-1-1	Normal	27	68	Normal
56-28-7	du	38	69	dull
56-58-1	ha	61	89	tarnished
56-88-5	su	30	65	wrinkled
56-103-2	su_2	40	55	translucent
56-118-8	wx	0	68	opaque
56-132-7	du ha	58	70	translucent
56-142-1	du su	64	68	wrinkled
56-150-7	du su_2	48	56	translucent
56-154-4	du wx	0	70	opaque, shrunken
56-182-1	ha su	60	85	translucent
56-288-3	ha su_2	55	83	opaque
56-686-4	ha wx	15	72	opaque, shrunken
56-197-4	su su_2	56	66	wrinkled
56-204-7	su wx	0	67	wrinkled
56-216-8	su_2 wx	0	53	opaque
56-702-1	du ha su	41	65	wrinkled
56-713-6	du ha su_2	48	70	translucent, shrunken
--------	du ha wx	--	--	----------
53-85-7	du su su_2	77	--	highly wrinkled
55-176-6	du su wx	--	--	highly wrinkled, no starch
56-246-4	du su_2 wx	--	--	opaque, shrunken
56-737-9	ha su su_2	54	80	wrinkled
56-680-3	ha su wx	--	--	highly shrunken
--------	ha su_2 wx	--	--	--------------
56-252-5	su su_2wx	--	--	highly wrinkled, no starch
56-94-4	su am	27	68	normal
55-69-6	du su am	45	70	translucent, shrunken

Birefringence end point temperatures are particularly consistent. Of the single gene stocks, su_2 is low, du, su, and wx are normal, and ha is high. In double combinations su_2 brings du and wx down to the su_2 level and these two genes in turn bring ha down to the normal level. The gene ha brings su up to the ha level which in turn brings su_2 up to the normal level. These results indicate rather specific effects of the genes on molecular organization.

With respect to amylose content, it appears that high values may be obtained by two separate systems, one system controlled by ha, and a second controlled by interaction of su, su_2, and du. It does not appear possible to get further increases in amylose content by combining genes in the two systems and in some combinations there is a marked depressing effect.

BREEDING HIGH AMYLOSE STARCH

M. S. Zuber and C. O. Grogan

Since 1950 numerous endosperm defectives have been analyzed for amylose content. Among a group of defective endosperms received from Dr. L. A. Tatum, then at the Kansas Agricultural Experiment Station, two defectives were found that gave an amylose content of 37-40 percent. Both defectives were derived from the selfing in the Cassel open-pollinated variety and are tentatively called ha_m122 and ha_m123. It is now proposed they be renamed ha_2. In 1955 seed of ha was secured from Dr. Kramer, and in this report will be referred to as ha_1.

In 1956 the two parents (ha_1 and ha_2), F_1 , F_2, and F_3 generations were grown in a nursery located near Columbia, Missouri. Amylose determinations were made by the Northern Utilization Research and Development Division of Peoria, Illinois, and these results revealed the following:

1. The factors responsible for the increased amylose content are non-allelic in the two parents.

2. It is possible to phenotypically classify F_2 kernels for high amylose content with a fair degree of success, particularly the yellow endosperm types.

3. Amylose determinations of F_3 ears gave a range from 25.4 to 70.3 percent. It is assumed the 70.3 percent represents the double recessive. If the factors in these two parents had been completely additive, the amylose content should be about 80 percent, provided other modifying genes or some unknown genetic system is operating which sets a ceiling beyond which the amylose percentage cannot be extended.

4. Limited amount of data from the conversion of standard inbred lines to ha_1 and ha_2 indicate some inbreds may have modifying genes that will increase amylose content. Some K55 conversions to ha_1 gave amylose percentages of 66 percent which exceeds the ha_1 parent by 18 percent. The results from a group of K55 conversions to ha_2 revealed none to exceed the ha_2 parent.

GENETIC STUDIES ON FACTORS FOR HIGH-AMYLOSE STARCH
E. H. Coe, Jr.

Factors for high-amylose starch have been difficult to distinguish from normal, since their visual effects are not very distinctive. An interaction of ha_1 and ha_2 with wx has been found, in which ha wx kernels show marked collapse, and, usually, translucence. The clarity of this interaction suggests that new factors for high-amylose content might best be sought in waxy lines, where their effects would be easily distinguished. Through this interaction, linkage of ha_1 with chromosome 5 has been confirmed, and linkage of ha_2 with chromosome 10 has been demonstrated. Interaction of ha_2 with sugary, in which ha_2 su kernels are less wrinkled than Ha su, has also been demonstrated, although this interaction is apparently not as strong as that previously reported for ha_1 su.

AFTERNOON SESSION, MARCH 6

The meeting was called to order by Chairman Rossman at 1:30 p.m. The Chairman indicated that the afternoon session would be devoted to reports on special topics of current interest by J. H. Lonnquist, G. F. Sprague, Earl R. Leng, G. H. Stringfield, J. B. Beckett and W. A. Russell. Brief summaries of these reports follow:

CURRENT STATUS OF THE NEBRASKA PROGRAM ON RECURRENT SELECTION
J. H. Lonnquist

Recurrent selection breeding systems were initiated at Nebraska over 10 years ago in an attempt to find a means of increasing the efficiency of developing inbred lines and superior hybrid combinations. As has been pointed out in published reports, the goal has been one of increasing the frequencies of favorable growth factors in populations of interest in the breeding program. A brief outline of the work underway at Nebraska and some recent results to be discussed follow:

A. Types of recurrent selection being studied

1. General combining ability
2. Specific combining ability
3. Reciprocal
4. Recurrent selection

B. Review of procedure

1. Ear to row plantings of open-pollinated ears
2. Selected plants in each row selfed to provide S_1 lines
3. S_1 lines (200-300 representing not more than 2 selections from each ear row above) planted in natural crossing block for top-crossing.

4. Better 100-200 lines on basis of S_1 progeny appearance selected for topcross testing. Replicated tests in 2 or 3 locations
5. Selected 10 percent of S_1 lines on basis of topcross performance intercrossed. Equal number of seeds from each intercross composited to provide syn-1 seed. Syn-1 composite planted in isolated block for random mating to provide syn-2 etc.
6. Syn-2 or syn-3 generation used as foundation material for next cycle.

Type of recurrent selection necessitates slight modification in procedure - particularly with respect to tester parents.

C. Measures of improvement

1. Synthetic performance
2. Cross performance   Table A. Parental and cross performance for 1st and 2nd cycles for five synthetics

   Table B. Krug and Reid vs 2nd cycle synthetics when crossed with a series of varietal populations

   Table C. Importance of tester

   KII-- Lines selected using a single cross tester.

   KII(a) " " " parental population (KI) as tester

3. Comparison of lines after each cycle of improvement. In test during 1957.

D. Genetic variance components

TableD. Additive genetic variances in parental Krug and after two cycles of recurrent selection ($K_{II(A)}$).

Table A. Relative yields of the F_1 intercrosses among five synthetics[1/] after the first and second cycle of improvement in comparison with the midparent and the higher yielding parent.

Pedigree	Cycle of Improvement I: Acre grain yield: Midparent	I: Acre grain yield: F_1	I: F_1 % of Midparent	I: F_1 % of High parent	II: Acre grain yield: Midparent	II: Acre grain yield: F_1	II: F_1 % of Midparent	II: F_1 % of High parent
	bu.	bu.			bu.	bu.		
U. S. 13		105.3				105.3		
K x A	97.4	115.2	118.3	108.7	103.8	117.0	112.7	109.6
K x B	93.4	106.6	114.1	108.8	100.6	109.2	108.5	108.3
K x R	92.1	106.8	116.0	111.9	100.1	108.0	107.9	107.1
K x SSS	91.2	110.0	120.6	117.5	102.0	112.9	110.7	109.4
A x B	102.0	102.8	100.8	97.0	103.6	114.5	110.5	107.2
A x R	100.7	107.7	107.0	101.6	103.1	114.4	111.0	107.1
A x SSS	99.8	115.0	115.2	108.5	105.0	112.4	107.0	105.2
B x R	96.7	101.2	104.7	103.3	99.8	114.7	114.9	114.4
B x SSS	95.8	104.7	109.3	106.8	101.8	109.1	107.2	105.7
R x SSS	94.5	103.1	109.1	108.1	101.3	113.6	112.1	110.1
Intercross Means	96.4	107.3	111.5	107.2	102.1	112.6	110.2	108.4

1/ Synthetic A originated as a composite of crosses among 9 elite lines.

Synthetic B originated as a composite of intercrosses among 25 lines of various origins in the Corn Belt which were no longer being used in the program at Nebraska.

Synthetic K originated from Krug Yellow Dent

Synthetic R originated from a strain of Reid

SSS - Stiff Stalk Synthetic

Table B. Krug Yellow Dent and Reid Yellow Dent vs II cycle derivatives when compared in a series of all possible combinations of 12 varieties. 1955-56 data (4 tests).

	Yield per acre	Moisture at harvest
	bu.	pct.
Parental Performance		
Krug Yellow Dent	91.2	14.8
$K_{II(A)}$ Syn	96.5	14.6
Reid Yellow Dent	86.6	13.7
Reid $_{II}$ Syn	90.4	16.8
Cross Performance (Prepotencies)		
Krug Yellow Dent	93.9	15.5
$K_{II(A)}$ Syn	102.3	15.1
Reid Yellow Dent	94.4	15.0
$Reid_{II}$ Syn	99.9	15.6
Specific Crosses		
Krug x Reid	93.2	14.9
$K_{II(A)}$ x $Reid_{II}$	106.4	15.9

Table C. Relative performance of two synthetics from the same parental population (K_I) but based upon different tester parents. K_{II} basic S_1 lines selected on basis of WF9 x M14 tester; $K_{II(A)}$ basic S_1 lines selected on basis of parental K_1 synthetic as tester. 10 tests, 1954-1956.

	Yield per acre	Moisture at harvest	Stalk lodging	Dropped ears
	bu.	pct.	pct.	pct.
K_{II}	94.7	16.5	17	7.2
$K_{II(A)}$	98.2	16.4	24	5.0
U.S. 13	99.7	15.8	11	10.4

Table D. Estimates of additive genetic variance components in parental Krug and after two cycles of recurrent selection for general combining ability ($K_{II(A)}$). Component analyses based on sib-cross progenies, 64 males each x 4 females within each population.

Character	Krug	$K_{II(A)}$
Yield	.0112	.0052
No. or ears	.0296	.0840
Ear diameter	.0160	1.2448
Ear length	.5592	.3764
Ear height	45.52	54.56
Plant height	65.40	45.92
Date of flower	6.92	5.23

G. F. Sprague commented that the present practice in the Iowa program is to use two years of tests with two locations per year for evaluation of combining ability. The first intercross population is used for resampling.

DWARF CORN HYBRIDS
Earl R. Leng

Promising results have been obtained during the past two years with new dwarf corn hybrids. These hybrids, which grow about four feet high, have shown outstanding resistance to lodging and have produced good yields in tests at Urbana and Brownstown. Farmers and seedsmen who have seen them have expressed interest in them, and further intensive investigations of field performance are planned. The answers to the following questions present the major information that is now available.

The chief difference between dwarf and normal plants is that the internodes of the dwarfs are much shorter than those of normal plants. The internodes below the ear are only one to three inches long instead of six inches or more as in normal corn. The number of internodes and leaves is essentially the same in dwarf hybrids as in normal types. As a result, the dwarfs average about four feet in height, and their ears are 12 to 20 inches above the ground. The ear height of comparable normal hybrids grown under the same conditions ranges from 42 to 56 inches.

Dwarf hybrids now under study have been produced by incorporating the single recessive genetic factor brachytic 2 into desirable standard inbred lines. This has been done by a program of backcrossing, selfing, and selection. Except for height the resulting dwarf lines have plant and ear characteristics similar to those of the corresponding normal lines. Since the dwarfing factor is a recessive genetic trait, it has to be incorporated into all four lines of a double-cross hybrid if a dwarf type is to be produced.

This year (1956) was the first in which dwarf double-cross hybrids were grown and compared with normal hybrids. Four dwarf hybrids tested at Urbana, where yields were very high, yielded about 20 percent less than the average of two desirable standard hybrids, Illinois 1421 and U. S. 13. At Brownstown, where tests were conducted both on Cisne silt loam (prairie soil) and on Wynoose silt loam (timber soil), the dwarf hybrids yielded virtually the same as four comparable standard hybrids. Yield data from these tests are summarized in the table below.

Hybrid	Urbana	Brownstown Cisne soil	Brownstown Wynoose soil
	bu.	bu.	bu.
Dwarf hybrids			
(9 x 2) (Fr6 x 678)	118	87	50
(9 x 2) (Ha6 x 31)	109	74	55
(9 x 2) (6D x 31)	111	79	45
(9 x 2) (Ha6 x Fr5)	108	71	43
Average, dwarfs	111	78	48
Normal hybrids			
Illinois 1421	140	83	..
Illinois 21	...	79	..
Illinois 1332	...	82	..
U. S. 13	136	86	..
Average, normals	138	82	46

These data, taken together with results from single-cross tests conducted in 1955, indicate that present dwarf hybrids may yield almost as much as good normal hybrids at productivity levels in the 50- to 85-bushel range. At higher productivity levels, there is reason to believe that these dwarf hybrids will yield 10 to 20 percent less than desirable standard types.

The major obvious advantage is their extreme resistance to lodging. In 1955, dwarf single crosses were 100 percent erect at harvest, while comparable normal hybrids ranged from 45 to 90 percent erect. In 1956, both dwarfs and normals were 100 percent erect when harvested in early October. However, in plots that were not harvested until the last week in November, the normal hybrids averaged 38 percent erect, while the dwarfs averaged 99 percent.

This drastic reduction in lodging offers hope that harvesting losses can be considerably reduced by growing dwarf hybrids. Other probable advantages include easier handling by corn combines, less shading of interplanted legumes, and lower water requirements. However, experimental data have not yet been obtained on any of these points.

The main obvious disadvantage is the likelihood of lower yield, at least under highly favorable growing conditions. Although this lower yield may be partly or entirely offset by reduced harvesting losses, it is nevertheless of major concern. Also, there is some indication that the dwarf hybrids now being studied may be more sensitive to crowding then standard hybrids. Late growth of weeds, particularly the grassy types, between rows is also a potential problem, because the dwarfs do not shade the ground so densely as do normal types.

Breeding work will be continued and intensified. Main emphasis will be placed on developing the best possible dwarf versions of standard hybrids. In 1957, intensive studies of cultural practices with dwarf hybrids will be started. These studies will include row spacings, planting rates, response to irrigation, response to various fertility levels, and harvesting trials with the corn combine, picker-sheller, and standard picker equipment. A series of trial plots in farmers' fields is also being planned. The results of these trials will be used as a basis for recommending whether desirable dwarf hybrids can be produced and grown successfully.

No seed of dwarf hybrids will be available in the next year. Experimental results do not yet make it certain that seed of the dwarf lines or hybrids should be released to the public. A decision on this point should be possible within the next two years. If the dwarf hybrids prove feasible for farm use, limited quantities of seed should be available for general distribution within the next five years. Initially seed release would be handled through the Illinois Seed Producers Association, according to the "delayed release" program customary with new inbred lines produced by the Illinois Agricultural Experiment Station.

CURRENT STATUS OF THE L. S. D.

G. F. Sprague

An F test is primarily a test for homogeniety of the variances involved. In many cases the investigator is not satisfied with an answer of the form that significant differences do or do not exist among the treatments compared in a single experiment. If significant differences exist he wishes to know which of the treatment means differ by a significant amount. The L.S.D. has commonly been used to provide such a test of significance. Unfortunately this test of significance is often misused.

The use of the L.S.D. for a test of the significance between two treatment means is valid in all cases where the particular contrasts are a part of the original design. The L. S. D. test is seldom appropriate for making comparisons between means solely on the basis of comparisons that appear interesting after the data are in hand.

Goulden (2) has suggested three general rules which may be helpful. These are:

1. Do not apply the t test to any differences between means unless the F test indicates that real differences are present.

2. Do not apply the t test simply because a difference looks big and you think it should be significant. There must be some logical reason for wishing to make the comparison quite independent of the results obtained.

3. It is valid to make any t test provided that the test is preconceived at the time the experiment is designed.

These limitations pose a real handicap to the experimenter and he is tempted to make comparisons regardless of their validity. This practice may lead to serious misconceptions with respect to the level of significance of any comparisons made. This may be illustrated by the fact that in many experiments where the F test indicates no significant difference among treatment means yet the difference between the extremes exceeds the calculated L.S.D.

Staticians would argue that such a comparison is not valid since it does not involve a test between two means chosen at random. Rather, it should be considered in the nature of a range. Considered from this viewpoint, neither sd nor L.S.D. provides an appropriate test.

Several procedures have been suggested which permit the experimenter to contrast selected items at will. These may vary in precision from those which have described under the title "Quick and dirty methods in Statistics" (3) to others which provide a fairly high degree of accuracy. The value of the various procedures depends largely on the type of question which the experimenter wishes answered.

One of the methods which appears to be reasonably accurate and also simple in operation is the multiple range and multiple F_1 test developed and proposed by Duncan (1). This procedure permits one to rank treatment means and to make any desired comparison between subsets.

1. Duncan, D. B., 1955
   Multiple range and Multiple F tests. Biometrics 11:1-42.

2. Goulden, C. H., 1952
   Methods of statistical analysis. 467 pp. John Wiley and Sons, Inc., N. Y.

3. Tukey, J. W., 1951
   Quick and dirty methods in statistics. Part II, Simple Analyses for standard designs. Proc. 5th Ann. Convention Amer. Soc. Quality Control. P. 189-197.

ADJUSTING FIELD PLOTS TO THEIR ADJACENT AND DISTRIBUTED CONTROLS

G. H. Stringfield

The study began with linearally placed items restricted to provide that each item has equal adjacency with respect to every other item. This led to a field design and a simple computation method for adjusting

the mean performance of 2-row corn plots in two-fold replication to the difference between the mean performance of their 8 adjacent (nearest) plots and the mean performance of the 8 distributed replicates of the adjacent plots. The method was shown to have materially reduced the variation between means in uniform plantings compared with randomized blocks. No method for obtaining good estimates of error for the adjusted means has been established.

MALE STERILITY AND RESTORER GENES
Jack B. Beckett

In the presence of Texas sterile cytoplasm, the introduction of restorer genes into WF9 by means of the Eckhardt method gave ratios approximating 1 fertile to 3 steriles, indicating the action of two dominant complimentary genes.

With a number of other inbreds, the ratio of 1 fertile to 1 sterile obtained indicated that 1 additional restorer gene was probably being introduced. However, since the fertile class contained varying proportions of partially fertile plants, the presence of additional modifying genes was postulated.

When K64 was used as the original source of restoration, the above relationships did not seem to apply, since WF9 appeared to require only one additional gene to express the fertile phenotype.

Results obtained with M14 as a restorer line gave inconsistent results which could not be easily interpreted.

STUDIES ON THE INHERITANCE OF RESISTANCE TO CORN LEAF RUST
W. A. Russell and A. L. Hooker

Genetic investigations on the inheritance of resistance to corn leaf rust, Puccinia sorghi Schw. were initiated at the Iowa State College in 1953 and since 1954 have been a cooperative project with the University of Wisconsin and Cereal Crops Section, A.R.S., U.S.D.A.

Isolates of the pathogen have been collected from widely separated areas in the United States and used in seedlings tests with over 300 corn strains from 10 countries. Sixty-eight of these corn strains showed protoplasmic resistance (chlorotic to necrotic flecks) to one or more of 59 isolates of the pathogen. Inbred B38 is resistant to 39 of 44 rust cultures with which it has been tested; K148 carries resistance to 37

of these same cultures. A strain known as Cuzco has been resistant to 59 cultures to which it has been tested. Strain GG208 has shown resitance to 43 of 44 cultures studied. Inheritance studies have shown that resistance is dominant in 44 corn strains and recessive in 10. Studies of F2 and backcross progenies have suggested three types of gene interaction: (1) one factor pair with resistance being dominant, (2) one factor pair with resistance being recessive, and (3) duplicate factors in which both must be present in the recessive phase for resistance to be expressed. The results have indicated also that the resistance in each of B38, K148, GG208 and Cuzco is due to one gene pair and that these genes along with two, or possibly three, from other sources are in an allelic series. At least two additional loci appear to be involved in the resistance of other strains. The action of some recessive genes for resistance is modified by temperature.

Physiologic specialization occurs in P. sorghi with at least 18 races of the pathogen differentiated using conventional methods. A series of nearly "isogenic" sublines of inbred B14 are being established by transferring single genes from the various sources of resistance to B14 by the backcross method. These will be available as differential varieties, as sources of resistant germ plasm, and for use in other studies.

Several new and effective sources of resistance, each conditioned by a single gene, have been located in these studies. The resistance in many of these and particularly in Cuzco, would appear to be valuable for transferring to American inbreds.

The meeting adjourned at 5:30 p. m.

MEETING OF THE EXECUTIVE COMMITTEE

The Executive Committee met immediately following the adjournment of the Corn Breeding Research Committee. C. O. Grogan was elected Chairman for the ensuing two years. The following changes in Committee assignments were adopted. N. P. Neal was appointed chairman of the Sub-Committee on Maturity Ratings to replace A. M. Strommen and Earl R. Leng was added to this committee. W. A. Russell was appointed to replace L. A. Tatum on the Sub-committee on Breeding Groups. E. L. Pinnell was dropped from the Sub-committee on Uniform Tests of 400, 500 and 600 Maturities. Frank Loeffel was added to the Sub-committee on 900 Maturities.

It was agreed that the name of the Committee on Cytoplasmic Sterility should include restorers.

MORNING SESSION, MARCH 7

The present meeting of the Corn Breeding Research Committee was extended an extra half day in order to accept a joint invitation from American Maize Products Company and National Starch Products Company to visit the corn wet-milling plant of American Maize at Roby. These two companies have cooperated closely and have been the principal processors of waxy corn starch since commercial production was initiated about 15 years ago.

On the morning of March 7 we were picked up at the LaSalle Hotel by field agents of the waxy corn production program and taken to Roby. There we assembled in Daly Hall for coffee and doughnuts, introductions, and a brief discussion of corn wet milling procedures by Charlie Ford. Committee members then were divided into small groups with individual guides for the tour of the extremely modern wet processing plant operated by American Maize Products Company. All of the starch tables formerly used in corn wet milling have been replaced by centrifugal separators in this plant.

Following the tour we returned to Daly Hall for luncheon as the joint guests of American Maize and National Starch. Following lunch we were welcomed to Roby by Mr. Earl E. Langland, Vice President-Production, American Maize Products Company. Mr. Langland introduced other representatives of the management of American Maize and two representatives of National Starch Products Company, Dr. C. G. Caldwell, Vice President and Director of Research and Mr. Robert Bintz, Assistant Vice President, and plant manager of the Indianapolis plant.

Dr. Caldwell spoke on "Research in the Corn Wet Milling Industry". A general discussion period followed which adjourned about 3:00 p. m., for return to Chicago.